

1998 ANNUAL REMEDIAL ACTION GROUND-WATER MONITORING REPORT

ORMET CORPORATION SUPERFUND SITE HANNIBAL, OHIO

MARCH 29, 1999

Prepared for:

Ormet Corporation Hannibal, Ohio

EPA Region 5 Records Ctr.



311551

Prepared by:



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March 31, 1999

Mr. Bernie Schorle Remedial Project Manager R-6J USEPA Region V 77 West Jackson Blvd. Chicago, IL 60604-3590

Dear Mr. Schorle:

Enclosed are two copies of the 1998 Annual Ground-Water Monitoring Report for the Ormet Superfund site. The report has been prepared in accordance with the Remedial Action Ground-Water Monitoring Plan (Revision 1 – April 28, 1997), which was submitted to the USEPA during Remedial Design.

Very truly yours

John Reggi, Director

Corporate Environmental Services

JDR:cr

Enclosures

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1998 ANNUAL REMEDIAL ACTION GROUND-WATER MONITORING REPORT ORMET CORPORATION SUPERFUND SITE HANNIBAL, OHIO

BACKGROUND/INTRODUCTION

Under the terms of a Consent Decree entered on December 18, 1995 between the United States Environmental Protection Agency (USEPA) and the Ormet Primary Aluminum Corporation for the Ormet Corporation Superfund Site, Ormet has undertaken Remedial Action (RA) at the site consisting of the following:

- Containment of the plume in the alluvial aquifer through continued pumping of the interceptor wells and Ormet Ranney well and treatment of ground water pumped by the interceptor wells using ferrous salt precipitation;
- Installation and operation of a soil flushing system in the Former Spent Potliner Storage Area (FSPSA);
- Capping of the former CMSD with a multi-layer cap, including construction of a TSCA-compliant cell within the CMSD for disposal of backwater area sediment containing PCBs;
- Installation of a drain system around the toe of the former CMSD to collect seeps, with treatment of the collected seep water using activated carbon followed by treatment at the ground-water treatment plant;
- Excavation of carbon material from the former carbon runoff and deposition area and disposal of the material in the former Construction Material Scrap Dump (CMSD);
- Excavation of sediment from the former Outfall 004 backwater area and disposal of the sediment in the CMSD; and
- Relocation of the Outfall 004 channel.

Areas of the site that were subject to remedial action are shown in Figure 1.

Remedial construction was initiated in April 1997 and was certified as being complete in August 1998. During the period from August 1998 through October 1998, the FSPSA soil flushing system was operated on a trial basis, with flushing occurring for a period of approximately three hours per day. Beginning in the spring of 1999, full operation of the soil flushing system is anticipated (i.e., flushing for eight hours per day).

As specified in the Statement of Work (SOW) attached to the Consent Decree, Ormet began a program of routine ground-water monitoring in conjunction with the completion of remedial construction. The purpose of ground-water monitoring is to document/evaluate changes in ground-water conditions beneath the site associated with the remedial actions. To provide a baseline characterization of ground-water conditions immediately prior to remedial activities, a sitewide ground-water monitoring event was conducted during May 5 to 9, 1997. Routine ground-water monitoring was initiated in May 1998. Ground- water monitoring activities have been conducted in accordance with the Remedial Action Ground-Water Monitoring Plan (Revision 1 - April 28, 1997), which was submitted to the USEPA during Remedial Design.

SUMMARY OF GROUND-WATER MONITORING PROGRAM

The current system of ground-water monitoring wells and piezometers at the Ormet site is shown in Figure 1. Under the RA Ground-Water Monitoring Plan, monitoring is to be conducted three times per year (approximately once every four months), beginning no later than four months following completion of remedial construction. In 1998, two ground-water monitoring events were conducted, during May 4 to 8 and August 31 to September 1.

Each monitoring event included measurement of water-level elevations at all MW- and TH-series monitoring wells, PPB-series piezometers monitoring the alluvial aquifer, and at the Ohio River pool measuring point RP-1. Water-level elevation data collected in conjunction with the baseline monitoring event (May 1997) and the 1998 monitoring events are provided in Tables 1, 2, and 3, respectively.

During each monitoring event, ground-water samples were collected from the following wells located within and downgradient of the FSPSA:

MW - 2	MW - 31
MW - 5	MW - 32
MW - 16	MW - 35
MW - 18	MW - 36
MW - 28	MW - 37

Each monitoring event also included sampling of monitoring well MW - 12, located immediately downgradient of the CMSD. These wells were identified in the RA Ground-Water Monitoring Plan as Points of Compliance, as required under Section II.6. of the Consent Decree SOW.

The RA Ground-Water Monitoring Plan specifies that one monitoring event each year is to be an expanded monitoring event which includes sampling of selected wells not hydraulically downgradient from any of the potential source areas at the site (i.e., background wells) and additional wells located within the plume outside of the FSPSA. These wells include the following:

MW-1	MW-29S & D
MW-7 (background)	MW-30
MW-8	MW-34S & D
MW-10	MW-39S & D
MW-11	MW-40S & D
MW-15	MW-41 (background)
MW-17	MW-42S & D
MW-19 (background)	

Water Sampling Log forms for the May 1997 baseline monitoring event and for each of the routine monitoring events conducted during 1998 are provided in Appendix A.

The primary purpose of the annual expanded monitoring event is to collect data to facilitate preparation of plume isopleth maps. Based on the isopleth maps, estimates of contaminant mass-in-place and the total area of the aquifer exceeding cleanup goals for selected indicator parameters were made and compared with estimates based on historical monitoring results as a means of assessing the progress of the remediation program. The expanded monitoring event to characterize baseline conditions at the start of remedial construction in 1997, and the expanded monitoring event for 1998 were both conducted in May to enable more direct comparison of the associated estimates of contaminant mass-in-place and aquifer area exceeding cleanup goals.

Ground-water samples from all monitoring wells were analyzed for constituents for which cleanup goals were specified in the Record of Decision (ROD) for the site; i.e., arsenic, beryllium, cyanide, manganese, vanadium, and fluoride. Samples were also analyzed for pH, specific conductance, and sodium, which are additional indicators of the plume in the alluvial aquifer. Terachlorothene (PCE) was analyzed in samples from the MW-2, MW-5, MW-18, MW-30, and

MW-31 monitoring wells, in which PCE was detected during the Remedial Investigation (RI). Ground-water analyses were performed by Kemron Environmental Services, Inc. (Kemron) of Marietta, OH. Kemron also provided analytical services during the RI, for treatability testing performed during Remedial Design, and during remedial construction. Methods used by Kemron to analyze ground-water samples from the RA monitoring events were as shown below.

		Ground-Water	Reporting
Analytical Parameter	Analytical Method	Clean-Up Goal (ug/L)	Limit (ug/L)
Arsenic	SW846/6010A-trace ICP	10*	4
Beryllium	SW846/6010A-trace ICP	4	0.5
Manganese	SW846/6010A	230*	10
Vanadium	SW846/6010A	260	10
Cyanide (total)	SW846/9010A	N/A	10
Cyanide (amenable)	SW846/9010A	200	10
Fluoride	EPA 340.2	4000	100
Tetrachloroethene	SW846/8260A	5	5
pН	EPA 150.1	N/A	N/A
Specific Conductance	EPA 120.1	N/A	N/A
Sodium	SW846/6010A	N/A	500

N/A - Not Applicable

Laboratory analytical reports for the May 1997 baseline monitoring event and for the two monitoring events conducted during 1998 are provided in Appendix B. The analytical results are summarized in Table 4. For purposes of comparison, Table 4 also includes available historical results for the

Final determination of cleanup goals for arsenic and manganese are pending. The USEPA and Ormet negotiated a Consent Decree and associated Statement of Work for implementation of the ROD. Because arsenic and manganese are common ground-water constituents in the Ohio River Valley and can occur naturally at concentrations above the cleanup goals presented in the ROD, the SOW specified that as part of the remedial Design process, Ormet would conduct a statistical evaluation to determine background levels of arsenic and manganese in the alluvial aquifer. The resulting background levels would then be considered for use as cleanup goals in place of the levels presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated background levels of 40 ug/L for arsenic and 9,780 ug/L for manganese.

parameters and wells being monitored. Analytical results for the 1998 monitoring events were validated by applying principles and concepts of the USEPA National Functional Guidelines. A data validation summary report is provided in Appendix C.

RESULTS OF 1997/1998 REMEDIAL ACTION GROUND-WATER MONITORING

GROUND-WATER FLOW

Water-level elevation data collected during the baseline monitoring event and the 1998 monitoring events (Tables 1 through 3) were used to construct the water table contour maps shown in Figures 2, 3, and 4. The ground-water elevation contours and associated ground-water flow patterns shown in Figures 2 through 4 are consistent with those previously mapped, indicating that the ground-water pumping component of the site remedy is effective in containing the plume in the alluvial aquifer beneath the Ormet Reduction Mill property and extracting contaminated ground water for treatment at Ormet's ground-water treatment plant. Ground-water flow in the alluvial aquifer is generally from northeast to southwest, toward the Ormet Reduction Mill Ranney well and interceptor wells. Current pumping maintains the water table at an elevation that is below the pool elevation of the Ohio River and a hydraulic potential does not exist for the natural discharge of ground water from the alluvial aquifer to the Ohio River along the river/plant boundary. The ground-water elevation contour map for the September 1998 monitoring event (Figure 4), indicates that the part-time operation of the FSPSA soil flushing system had no discernable effect on ground-water flow patterns beneath that area of the site.

Pumping by the Ormet Reduction Mill Ranney well and the Ormet Rolling Mill Ranney well (located approximately 2000 feet west of the Reduction Mill Ranney well) have created large cones of influence around each pumping center, which converge to form a gently rounded ground-water divide that is situated roughly parallel to and west of the fenceline separating the two plants. A ground-water divide is hydraulically a high point, or ridge, in the surface of the water table. The ground-water divide creates a hydraulic barrier, such that ground water on the west side of the divide flows toward the Rolling Mill Ranney well, and ground water on the east side flows toward the Reduction Mill Ranney well and interceptor well. By this condition, a hydraulic potential does not exist for ground water beneath the Reduction Mill to flow toward the Rolling Mill Ranney well.

GROUND-WATER QUALITY

Time vs. Concentration Trends

To evaluate changes in plume concentrations within the alluvial aquifer beneath the Ormet site, concentration versus time graphs were prepared for each monitoring parameter for which a cleanup goal was established in the ROD, with each parameter being graphed separately for each of the compliance point wells identified in the RA Ground-Water Monitoring Plan (see Appendix D). Analytical results for sodium have also been graphed, because it is an additional indicator of overall water quality in the plume. The graphs show the analytical results for the May 1997 and May and September 1998 monitoring events, along with other historical data. Summaries of time versus concentration trends and comparisons of the latest reported concentrations versus cleanup goals or background concentrations for the compliance wells are provided in the following tables.

SUMMARY OF TIME VS. CONCENTRATION TRENDS

	AMEN.						
	CN	As	Be	Mn	\mathbf{V}	F	Na
Wells within FSPSA							
MW - 32		$\!$		1		$\!$	1
MW - 35	î	1		Î		$\!$	1
MW - 36		Î		1		î	1
MW - 37		1		1		↓	Į.
Downgradient Edge of FSPSA							
MW - 16	1	II.		# ₩		U	1
MW - 18	ţ				11	#	II.
MW - 28	1						
MW - 31			î	↓ ↑	î		
Mid - Plant Area							
MW - 2	#	II.		↓	$\downarrow\!$	1	1
MW - 5	1	1		$\downarrow\!\!\!\downarrow$		1	1
Downgradient of CMSD							
MW - 12				1		1	

Amen. CN - Amenable Cyanide; As - Arsenic; Be - Beryllium; Mn - Manganese; V - Vanadium F - Fluoride; Na - Sodium

^{↑ -} Trend of increasing concentration. ↓ - Trend of decreasing concentration. -- No apparent trend. Combinations of symbols indicate changes in trends.

COMPARISON OF LATEST REPORTED CONCENTRATION VERSUS CLEANUP GOALS/BACKGROUND

	AMEN.					
	CN	As	Be	Mn	V	F
Wells within FSPSA						
MW - 32		*	*	+	*	
MW - 35		*	*	+	*	
MW - 36	*		*	+	*	
MW - 37		+	*	+	*	
Downgradient Edge of FSPSA						
MW - 16		*	*	+	*	
MW - 18	*		*	+	*	*
MW - 28	*	*	*	*	*	
MW - 31	*	++	*	+	*	
Mid-Plant Area						
MW - 2			*	+	*	
MW - 5	*	*	*	*	*	
Downgradient of CMSD						
MW - 12	*	*	*	+	*	*

 $Amen.\ CN-Amenable\ Cyanide;\ As-Arsenic;\ Be-Beryllium;\ Mn-Manganese;\ V-Vanadium;\ F-Fluoride\\ *-Latest\ result\ below\ ROD\ Cleanup\ Goal.$

^{+ -} Latest result above Cleanup Goal, but below background. ++ - Latest result above background, but below MCL.

Discussions of the time versus concentrations trends for each parameter for which a cleanup goal has been established are provided in the following sections.

Cyanide (Amenable to Chlorination)

The cleanup goal for cyanide established in the ROD (0.2 mg/L) is the Safe Drinking Water Act Maximum Contaminant Level (MCL) for cyanide amenable to chlorination. Cyanide amenable to chlorination is that portion of total cyanide which is weakly bound in cyanide complexes or is in the form of free (non-complexed) cyanide. Cyanide amenable to chlorination is a more reactive form of cyanide than the more strongly bound metal-cyanide complexes (e.g., iron cyanide). The form of cyanide occurring in the ground water beneath the Ormet site appears to be predominantly the stable cyanide complexes, which exhibit relatively low toxicity. This interpretation is supported by the relative concentrations of total versus amenable or free cyanide reported in ground-water samples from the site; i.e., the concentration of amenable or free cyanide is typically much lower than the total cyanide concentration in a sample. As discussed later in the report, the area of the alluvial aquifer containing concentrations of amenable cyanide above the cleanup goal is much smaller than the area of aquifer containing total cyanide at levels above 0.2 mg/L.

Analyses for amenable cyanide tend to be subject to a higher degree of variability than other plume indicators, such as total cyanide and fluoride. Consequently, concentration versus time graphs for amenable cyanide are somewhat erratic and exhibit less consistent trends. For this reason, the long-term concentration trends for amenable cyanide at a given monitoring well are more significance than fluctuations observed from one monitoring event to the next.

Concentration versus time graphs for amenable cyanide are presented in Appendix D-1. At six of the eleven compliance point wells, the most recently reported amenable cyanide concentration was below the clean-up goal of 0.2 mg/L. At three of the wells (MW-2, MW-18, MW-28) amenable cyanide concentrations show a downward trend relative to historical data. At two of the wells (MW-16 and, recently, MW-35), amenable cyanide concentrations exhibit an upward trend.

Fluoride

Of the main plume indicators, fluoride is less prone to analytical variability than cyanide, and potentially a more reliable indicator of changes in overall plume quality. Concentration versus time graphs for fluoride for each of the compliance wells are provided in Appendix D-2.

The most recent result for fluoride was below the cleanup goal of 4 mg/L at two of the eleven compliance point wells, MW-12 and MW-28, and a downward concentration trend was observed at eight of the compliance wells (MW-2, MW-5, MW-12, MW-16, MW-18, MW-32, MW-35, and MW-37). The only compliance well in which the concentration of fluoride appears to be increasing is MW-36.

Arsenic

Concentration versus time graphs for arsenic for each of the compliance point wells are provided in Appendix D- 3. At six of the eleven compliance point wells, MW-2, MW-5, MW-16, MW-32, MW-35, and MW-37, the concentrations of arsenic reported during recent sampling events are substantially lower than levels reported during the Phase I RI. For three of these wells (MW-32, MW-35, MW-37), the data exhibit a continuing downward trend. Data for the MW-36 well show an increasing trend.

As discussed earlier in this report, the final cleanup goal for arsenic is pending. In the ROD, the cleanup goal for arsenic was set at 0.010 mg/L. The MCL for arsenic is 0.050 mg/L. Because arsenic is a common constituent of ground water in the Ohio River Valley for which naturally-occurring concentrations can exceed the cleanup goal presented in the ROD, the SOW specified that as part of the Remedial Design process, Ormet would conduct a statistical evaluation to determine the background level of arsenic in the alluvial aquifer. The resulting background level would then be considered for use as the cleanup goal in place of the level presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems

Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated a background level of 40 ug/L for arsenic. At six of the compliance wells (MW-5, MW-12, MW-16, MW-28, MW-32, MW-35), the most recent results are below the 0.010 mg/L cleanup goal presented in the ROD; at MW-37, the most recent result is below the background value of 0.040 mg/L; and, at MW-31, the most recent result is below the MCL of 0.050 mg/L.

Beryllium

Concentration versus time graphs for beryllium are provided in Appendix D-4. The cleanup goal for beryllium established in the ROD was the MCL, 0.004 mg/L. Beryllium was reported above the MCL only in samples collected during the Phase I RI (June/July 1988) and only at two wells: MW-18 and MW-37. Since the Phase I RI, beryllium has been consistently below the MCL in all samples analyzed, including samples from all of the compliance point monitoring wells during the May 1997 baseline monitoring event and the May and September 1998 routine monitoring events. At the MW-31 well, data for the past four sampling events show an increasing trend, but the most recent value (0.0014 mg/L) is still below the MCL.

Manganese

Concentration versus time graphs for manganese are provided in Appendix D-5. Analytical results for manganese exhibit a decreasing trend for three of the compliance wells, MW-2, MW-5, and MW-37. Manganese results for MW-12 show a slight increasing trend. At MW-16, MW-32, MW-35, and MW-36, and possibly MW-31, manganese levels show an increasing trend during more recent monitoring events.

As discussed for arsenic, the final cleanup goal for manganese is pending. In the ROD, the cleanup goal for manganese was set at 0.230 mg/L. Because manganese is a common constituent of ground-water in the Ohio River Valley for which naturally-occurring concentrations can be well

above the cleanup goal presented in the ROD, the SOW specified that as part of the remedial Design process, Ormet would conduct a statistical evaluation to determine the background level of manganese in the alluvial aquifer. The resulting background level would then be considered for use as the cleanup goal in place of the level presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated a background level of 9,780 ug/L for manganese.

At MW-5 and MW-28, the most recent results for manganese are below the 0.230 mg/L cleanup goal presented in the ROD. Manganese concentrations were below the background level in all of the compliance wells during the May 1997 baseline sampling event and during each of the 1998 monitoring events.

Vanadium

Concentration versus time graphs for vanadium are provided in Appendix D-6. The cleanup goal for vanadium established in the ROD was 0.260 mg/L. As with beryllium, vanadium was reported at or above the cleanup goal only in samples collected during the Phase I RI (June/July 1988) and only at two wells: MW-2 and MW-37. Since the Phase I RI, vanadium has been consistently below the cleanup goal in all samples analyzed, including samples from all of the compliance point monitoring wells during the May 1997 baseline monitoring event and the May and September 1998 routine monitoring events.

Tetrachloroethene (PCE)

Under the RA Ground-Water Monitoring Plan, analyses for tetrachloroethene (PCE) were performed on samples from five of the compliance wells where PCE was detected during the RI, MW-2, MW-5, MW-18, MW-30, and MW-31. A graph showing PCE concentrations versus time for these five wells is provided as Appendix D-7. Since the Phase I RI, PCE concentrations have

shown a decline at MW-2, MW-5, and MW-31; PCE levels have increased at MW-30. The cleanup goal for PCE is the MCL of 0.005 mg/L. The most recent results for PCE were at or below the MCL (also the detection limit) at MW-2 and MW-5. Of the five wells monitored for PCE, MW-2 and MW-5 are the two most downgradient, indicating a decrease in the area of the aquifer affected by PCE.

Contaminant Mass-in-Place

In accordance with Section II.3.C. of the Consent Decree SOW, data from the May 1997 baseline monitoring event and the May 1998 expanded routine monitoring event were used to estimate the masses of fluoride and cyanide (the primary plume indicators) in the alluvial aquifer as a means of evaluating the progress of the remediation. The procedure used for estimating the massin-place was as described in the RD Work Plan and the HydroSystems Management, Inc. (HMI) report titled, Estimation of Dissolved Contaminant Mass in the Alluvial Aquifer, Ormet Primary Aluminum Corporation Superfund Site, Hannibal, Ohio (August 28, 1996) that was submitted to the USEPA in conjunction with the 30% RD submittal. The approach used for estimation of contaminant mass-in-place is based on methods described in Methods for Monitoring Pump-and-Treat Performance (USEPA, July 1994). Results of the mass-in-place estimates for fluoride and cyanide are summarized in Table 5. For comparison, Table 5 also includes fluoride and cyanide mass-in-place estimates based on data from ground-water sampling conducted during the Phase I RI (June 1988) and on data from ground-water sampling conducted during January 1995. The mass-inplace estimates are based on the fluoride and total cyanide isopleth maps shown in Figures 5 through 12. Data and supporting calculations for the May 1997 and May 1998 mass-in-place estimates are provided in Appendix E. Data and supporting calculations for the 1988 and 1995 mass-in-place estimates were submitted to the USEPA in the August 1996 HMI report.

Based on the estimates presented in Table 5, the masses of fluoride and cyanide in the alluvial aquifer declined substantially during the period from June 1988 through May 1998. During this 10-year period, the estimated mass of fluoride in the alluvial aquifer declined approximately

72% (85,702 lbs. to 23,888 lbs.) and the estimated mass of cyanide declined approximately 62% (6,821 lbs. to 2,597 lbs.).

To assess the extent to which cyanide and fluoride continue to leach from soil in the FSPSA, the masses of fluoride and cyanide removed from the aquifer through pumping of the interceptor wells and Ranney well for the period between the two most recent expanded monitoring events (i.e., May 1997 through May 1998) were calculated and compared to the reductions in the estimated masses in the aquifer. The masses of cyanide and fluoride removed through pumping of the interceptor wells were calculated using daily analytical and flow data for the influent to Ormet's ground-water treatment plant, which receives the water pumped by the interceptor wells. The masses of cyanide and fluoride removed through pumping of the Reduction Mill Ranney well was calculated using quarterly analytical data and daily flow data collected by Ormet for NPDES reporting purposes.

During the period from May 1997 to May 1998, approximately 26,380 pounds of fluoride and approximately 3,625 pounds of cyanide (total) were removed from the alluvial aquifer by the interceptor wells and Ranney well. During the same period, the estimated mass of fluoride in the aquifer decreased by approximately 5,145 pounds and the estimated mass of cyanide decreased by approximately 346 pounds. That the masses of fluoride and total cyanide removed through pumping exceeded the mass-in-place decreases during the same period is attributed to continued leaching of fluoride and cyanide from the residual spent potliner material in the soil in the FSPSA. The purpose of soil flushing in the FSPSA is to accelerate the rate at which contaminants are leached from the source area soils and subsequently removed from the aquifer and treated.

Aquifer Area Above Cleanup Goals

As a further check of the progress of the remediation, the approximate areas of the aquifer containing fluoride and cyanide at concentrations above their respective cleanup goals were estimated using analytical results from the Phase I RI (June-July, 1988) and the January 1995, May

1997, and May 1998 sampling events. The results are summarized in Table 5. The estimates of aquifer areas above the cleanup goal are based on the fluoride and amenable cyanide isopleth maps shown in Figures 5 through 8 and Figures 13 through 16, respectively.

The area of the alluvial aquifer containing fluoride above the cleanup goal increased slightly between 1988 (approximately 43 acres) and 1995 (approximately 48 acres). Since 1995, the area above the cleanup goal for fluoride has decreased about 24%, to approximately 37 acres.

The area of the aquifer with concentrations of amenable cyanide above the cleanup goal of 0.2 mg/L shows a substantially greater degree of variability than for fluoride. As discussed previously, analyses for amenable cyanide tend to be subject to a higher degree of variability than other plume indicators, such as total cyanide and fluoride. For these reasons, trends in the area of the aquifer with amenable cyanide above its cleanup goal tend to be less consistent and should be regarded in a long-term context. Overall, the area of the aquifer exceeding the cleanup goal for amenable cyanide has decreased during the period from 1988 to 1998. The area calculated using data from the 1988 Phase I RI was approximately 24.5 acres; the area calculated using data from the 1998 expanded sampling event was approximately 10.5 acres. This represents a decrease of about 57%.

SUMMARY/CONCLUSIONS

- Pumping of Ranney well and interceptor wells continues to provide containment of the plume beneath the Ormet property and removes contaminant mass from the alluvial aquifer.
- Part-time operation of the soil flushing system had no discernable effect on ground-water flow patterns beneath the FSPSA, and the flow of ground water continues to be from the river to the aquifer.
- Pumping of the interceptor wells and Ranney well removed approximately 26,380 pounds of fluoride and approximately 3,625 pounds of cyanide from the alluvial aquifer during the period May 1997 to May 1998.
- During the same period, the estimated masses of fluoride and cyanide in the aquifer decreased by about 5,145 pounds (18%) and 346 pounds (12%), respectively.
- In the 10-year period between the Phase I RI (1988) and the May 1998 monitoring event, the estimated masses of fluoride and cyanide in the aquifer have decreased from 85,702 pounds to 23,888 pounds (72%) and from 6,821 pounds to 2,597 pounds (62%), respectively.
- The masses of cyanide and fluoride estimated to have been removed from the aquifer by pumping from May 1997 to May 1998 exceed the estimated mass decreases in the aquifer during the same time period. This is attributed to continued leaching of fluoride and cyanide from soils in the FSPSA.
- The goal of the soil flushing system in the FSPSA is to accelerate the rate at which
 contaminants are removed from the source area soils and subsequently removed from the
 aquifer and treated.

- The estimated area of the alluvial aquifer with fluoride concentrations above the cleanup goal set forth in the ROD decreased by approximately 24% from the time of the Phase I RI to May 1998 (43 acres to 37 acres).
- The estimated area of the aquifer with amenable cyanide concentrations above the cleanup goal set forth in the ROD decreased by approximately 57% from the time of the Phase I RI to May 1998 (24.5 acres to 10.5 acres).
- Reductions in the area of the plume in the alluvial aquifer and the contaminant mass-in-place occurred prior to the completion of Remedial Construction and full-time operation of the FSPSA soil flushing system. These improvements in site conditions are attributable to operational changes and remedial activities undertaken by Ormet prior to the Superfund project, including pumping of wells that intercept the plume, which has been ongoing since 1972, and discontinued use of the disposal ponds and the potliner storage area.

TABLE 1 WATER-LEVEL ELEVATION DATA ORMET CORPORATION HANNIBAL, OHIO DATE: MAY 5, 1997

WATER-LEVEL	MEASURING POINT ELEVATION	DEPTH TO WATER	GROUND-WATER ELEVATION
MEASURING POINT	(ft. MSL)	(feet)	(ft. MSL)
MW-1	668.07	54.88	613.
MW-2	668.12	57.99	610.
MW-3	645.17	29.53	615.0
MVV-4	661.07	59.55	601.
MW-5	668.16	65.30	602.
MW-7	667.94	60.18	607.
MW-8	667.71	71.56	596.
MW-9	666.59	69.76	596.
MVV-10	667.16	71.40	595.
MVV-11	667.31	65.14	602.
MW-12	636.73	23.30	613.
MW-13	661.44	41.96	619.
MVV-14	653.59	38.03	615.
MW-15	657.31	37.75	619.
MW-16	662.72	48.99	613.
MW-17	655.03	37.50	617.
MW-18	660.91	39.84	621.
MW-19	662.03	41.50	620.
MW-20	632.33	12.08	620.
MW-21s	664.02	66.80	597.
MW-21d	663.60	66.39	597.
MW-22s	667.47	70.53	596.
MW-22d	667.21	70.28	596.
MW-23s	663.18	65.66	597.
MW-23d	663.41	66.01	597 .
MW-24s	667.88	71.59	596.
MW-24d	667.75	71.48	596.
MW-25	667.73	65.21	602.
MW-26s	665.54	68.91	596.
MW-26d	665.59	69.03	596.
MW-27	667.86	67.04	600.
MW-28	663.27	20.56	642.
MW-29s	653.40	40.10	613.
MVV-29d	653.07	39.70	613.
MW-30	667.58	49.02	618.
MW-31	661.59	46.92	614.
MW-32	656.66	40.10	616.
MW-33s	653.24	A	
MVV-33d	653.22	A	
MW-34s	655.67	36.72	618.
MVV-34d	654.67	35.67	619.
MW-35	661.90	36.37	625.
MW-36	655.14	36.52	618.
MW-37	661.14	19.40	641.
MW-38	666.64	19.98	646.
MVV-39s	657.30	41.10	616.
MW-39d	657.18	40.82	616.
MW-40s	662.22	51.97	610.
MW-40d	661.95	51.77	610.
MW-41	637.67	13.50	624.
MW-42s	654.37	40.04	614.
MW-42d	654.34	39.93	614.
MW-43s	633.68	A	
MW-43d	633.12	A	
MW-44s	662.01	52.15	609.
MW-44d	661.76	52.68	609.

TABLE 1 (CONT.) WATER-LEVEL ELEVATION DATA ORMET CORPORATION HANNIBAL, OHIO

DATE: MAY 5, 1997

	MEASURING	DEPTH TO	GROUND-WATER
WATER-LEVEL	POINT ELEVATION	WATER	ELEVATION
MEASURING POINT	(ft. MSL)	(feet)	(ft. MSL)
PPB-01*	663.24	17.10	646.14
PPB-02s*	663.14	17.49	645.65
PPB-02d+	662.78	43.22	619.56
PPB-04+	661.57	45.49	616.08
PPB-05*	661.62	17.30	644.32
PPB-06+	663.04	45.33	617.71
PPB-07*	661.71	Not Found	-
PPB-09+	664.30	43.58	620.72
PPB-10*	663.45	12.52	650.93
PPB-14*	660.64	33.16	627.48
TH-3	667.81	59.11	608.70
TH-10	658.17	37.97	620.20
TH-11	659.08	36.73	622.35
TH-15	663.62	67.16	596.46
TH-16	664.62	67.48	597.14
TH-17	663.93	66.60	597.33
RP-1	643.17	19.00	624.17
RP-2	643.05	19.27	623.78

NOTE:

 $\ensuremath{\mathsf{All}}$ MW-series wells are measured from the top of the PVC casing.

All TH-series wells are measured from the top of steel casing.

River pool (RP) measuring points are located on the walkway below the dry scrubbers.

East INT & WEST INT refer to the old interceptor wells near the Ormet Ranney well.

- * Designates a perched zone piezometer
- + Designates an alluvial aquifer piezometer.
- A Wells abandoned April 1997

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TABLE 2 WATER-LEVEL ELEVATION DATA ORMET CORPORATION HANNIBAL, OHIO DATE: April 17, 1998

	MEASURING	DEPTH TO	GROUND-WATER
WATER-LEVEL	POINT ELEVATION	WATER	ELEVATION
MEASURING POINT	(ft. MSL)	(feet)	(ft. MSL)
MVV-1	668.07	55.39	612.68
MW-2	668.12	58.99	609.13
MVV-3	645.17	30.31	614.86
MW-4	661.07	61.69	599.38
MW-5	668.16	67.25	600.91
MVV-7	667.94	61.05	606.89
MW-8	667.71	74.40	593.31
MW-9	666.59	73.53	593.06
MVV-10	667.16	74.64	592.52
MW-11	667.31	67.19	600.12
MW-12	636.73	24.09	612.64
MW-13	661.44	42.23	619.21
MVV-14	653.59	38.65	614.94
MVV-15	657.31	38.13	619.18
MVV-16	662.72	49.74	612.98
MVV-17	655.03	37.99	617.04
MW-18	660.91	40.19	620.72
MVV-19	662.03	41.78	620.25
MVV-20	632.33	12.14	620.19
MW-21s	664.02	70.92	593.10
MW-21d	663.60	70.52	593.09
MW-216	667.47	74.36	593.11
	667.21		593.08
MW-22d	663.18	74.13	593.25
MW-23s		69.93	
MW-23d	663.41	70.28	593.13
MW-24s	667.88	75.04	592.84
MW-24d	667.75	74.93	592.82
MW-25	667.73	66.68	601.05
MVV-26s	665.54	72.51	593.03
MVV-26d	665.59	72.67	592.92
MW-27	667.86	68.80	599.06
MW-28	663.27	22.26	641.01
MW-29s	653.40	40.86	612.54
MW-29d	653.07	40.47	612.60
MVV-30	667.58	49.52	618.06
MVV-31	661.59	47.68	613.91
MVV-32	656.66	40.68	615.98
MW-34s	655.67	37.12	618.55
MW-34d	654.67	36.07	618.60
MW-35	661.90	36.62	625.28
MW-36	655.14	Not Found	
MW-37	661.14	20.87	640.27
MW-38	666.64	20.42	646.22
MW-39s	657.30	41.68	615.62
MW-39d	657.18	41.35	615.83
MW-40s	662.22	52.93	609.29
MW-40d	661.95	52.75	609.20
MW-41	637.67	12.99	624.68
MW-42s	654.37	40.74	613.63
MW-42d	654.34	40.61	613.73
MW-44s	662.01	53.18	608.83
MW-44d	661.76	53.72	608.04

TABLE 2 (CONT.) WATER-LEVEL ELEVATION DATA ORMET CORPORATION HANNIBAL, OHIO

DATE: April 17, 1998

	MEASURING	DEPTH TO	GROUND-WATER
WATER-LEVEL	POINT ELEVATION	WATER	ELEVATION
MEASURING POINT	(ft. MSL)	(feet)	(ft. MSL)
PPB-01*	663.24	18.64	644.60
PPB-02s*	663.14	17.51	645.63
PPB-02d+	662.78	43.57	619.21
PPB-04+	661.57	46.09	615.48
PPB-05*	661.62	18.84	642.78
PPB-06+	663.04	Buried	_
PPB-07*	661.71	Not Found	
PPB-09+	664.30	43.59	620.71
PPB-10*	663.45	13.88	649.57
PPB-14*	660.64	Dry	
TH-3	667.81	60.24	607.57
TH-10	658.17	38.36	619.81
TH-11	659.08	37.14	621.94
TH-15	663.62	70.62	593.00
TH-16	664.62	71.50	593.12
TH-17	663.93	70.78	593.15
RP-1	643.17	18.72	624.45
RP-2	643.05	18.89	624.16

NOTE:

All MW-series wells are measured from the top of the PVC casing.

All TH-series wells are measured from the top of steel casing.

River pool (RP) measuring points are located on the walkway below the dry scrubbers.

- * Designates a perched zone piezometer
- + Designates an alluvial aquifer piezometer.

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TABLE 3 WATER-LEVEL ELEVATION DATA ORMET CORPORATION HANNIBAL, OHIO DATE: August 31, 1998

WATER-LEVEL	MEASURING POINT ELEVATION	DEPTH TO WATER	GROUND-WATER ELEVATION
MEASURING POINT	(ft. MSL)	(feet)	(ft. MSL)
MW-1	668.07	54.66	613.
MW-2	668.12	57.39	610.

	MEASURING	DEPTH TO	GROUND-WATER
WATER-LEVEL	POINT ELEVATION	WATER	ELEVATION
MEASURING POINT	(ft. MSL)	(feet)	(ft. MSL)
MVV-1	668.07	54.66	613.41
MVV-2	668.12	57.39	610.73
MVV-3	645.17	28.94	616.23
MVV-4	661.07	58.82	602.25
MW-5	668.16	64.59	603.57
MW-7	667.94	59.91	608.03
MW-8	667.71	71.30	596.41
MW-9	666.59	69.45	597.14
MW-10	667.16	71.20	595.96
MVV-11	667.31	64.46	602.85
MW-12	636.73	22.68	614.05
MVV-13	661.44	41.52	619.92
MVV-14	653.59	37.42	616.17
MVV-15	657.31	37.46	619.85
MVV-16	662.72	48.42	614.30
MVV-17	655.03	37.08	617.95
MVV-18	660.91	39.85	621.06
MVV-19	662.03	41.37	620.66
MVV-20	632.33	11.80	620.53
MW-21s	664.02	66.43	597.59
MW-21d	663.60	66.02	597.58
MW-22s	667.47	70.21	597.26
MW-22d	667.21	69.98	597.23
MW-23s	663.18	65.33	597.85
MW-23d	663.41	65.69	597.72
MW-24s	667.88	71.34	596.54
MW-24d	667.75	71.23	596.52
MVV-25	667.73	65.37	602.36
MW-26s	665.54	68.63	596.91
MVV-26d	665.59	68.74	596.85
MW-27	667.86	66.97	600.89
MW-28	663.27	21.06	642.21
MW-29s	653.40	39.50	613.90
MW-29d	653.07	39.11	613.96
MVV-30	667.58	48.93	618.65
MVV-31	661.59	46.40	615.19
MW-32	656.66	39.48	617.18
MW-34s	655.67	37.24	618.43
MVV-34d	654.67	35.33	619.34
MVV-35	661.90	36.31	625.59
MW-36	655.14	37.71	617.43
MW-37	661.14	19.31	641.83
MVV-38	666.64	20.18	646.46
MW-39s	657.30	40.61	616.69
MW-39d	657.18	40.33	616.85
MW-40s	662.22	51,30	610.92
MW-40d	661.95	51.10	610.85
MW-41	637.67	13.33	624.34
MW-42s	654.37	39.51	614.86
MW-42d	654.34	39.39	614.95
MW-44s	662.01	51.40	610.61
MW-44d	661.76	51.89	609.87
<u> </u>			

TABLE 3 (CONT.) WATER-LEVEL ELEVATION DATA ORMET CORPORATION HANNIBAL, OHIO

DATE: August 31, 1998

	MEASURING	DEPTH TO	GROUND-WATER
WATER-LEVEL	POINT ELEVATION	WATER	ELEVATION
MEASURING POINT	(ft. MSL)	(feet)	(ft. MSL)
PPB-01*	663.24	19.27	643.
PPB-02s*	663.14	17.63	645.
PPB-02d+	662.78	43.02	619
PPB-04+	661.57	45.02	616
PPB-05*	661.62	18.78	642
PPB-06+	663.04	47.05	615
PPB-07*	661.71	Not Found	
PPB-09+	664.30	43.17	621
PPB-10*	663.45	14.42	649
PPB-14*	660.64	Dry/33.55	<627
TH-3	667.81	58.38	609
TH-10	658.17	37.78	620
TH-11	659.08	36.52	622
TH-15	663.62	66.86	596
TH-16	664.62	67.12	597
TH-17	663.93	66.25	597
RP-1	643.17	18.79	624
RP-2	643.05	19.04	624

NOTE:

All MW-series wells are measured from the top of the PVC casing.

All TH-series wells are measured from the top of steel casing.

River pool (RP) measuring points are located on the walkway below the dry scrubbers.

- * Designates a perched zone piezometer
- + Designates an alluvial aquifer piezometer.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

Tetrachloroethene	·	0.011 0.008 0.0053 <0.005	0.012 <0.005 <0.005 <0.005 <0.005	
Vanadium	0.006 <0.01 <0.01	0.251 0.09 0.06 0.06	0.025 <0.01 <0.01 <0.01 <0.01	0.0032 <0.01 <0.01 <0.01 <0.01
Sodium	14.2 14.9 16.2 20.3 20.3 20.3	1,950 2,290 2,460 2,150 2,060 1,450 1,200 520 520 470 440	880 1,030 850 710 650 449 270 310 300	49.0 49.2 58.0 64.0 64.2 72 89 84
Manganese	0.65 0.54 0.33 0.15 0.379 0.39 0.10	1.98 2.46 2.1 1.74 1.82 1.00 0.82 0.93	1.61 1.39 1.7 1.01 0.93 0.514 0.27 0.4 0.17	7.88 4.72 4.65 3.70 3.05 2.3 2.2 2.2
Iron	0.04 0.02 0.04 0.04 6.21 6.04	55.2 58. 59.3 54.0 54.0 34.2 31.0	17.5 18.0 19.4 15.8 13.0 7.05 1.3	1.01 9.0 11.6 24.7 17.6
Beryllium	<0.0015 <0.01 <0.0005 <0.0005	<0.01<0.0015<0.001<0.001<0.001<0.0008	 40.01 40.015 40.01 40.005 40.0005 40.0005 40.0005 	<0.0015<0.01<0.005<0.0005<0.0005
Arsenic	0.0024 <0.004 <0.004 <0.004	0.394 0.085 0.082 0.086	0.076 0.008 0.015 0.007 0.007 0.0089	0.012 0.040 0.038 0.038 0.051
Fluoride	0.1 0.1 <0.2 <0.2 0.2 0.1 0.20	400 400 400 390 330 200 63 63	130 120 140 91 70 70 90 90 91 18 18	0.1 0.1 40.2 40.2 0.2 0.10 0.20
Cyanide Amenable	0.01 0.01	12 29.6 <0.01 <1.0 <0.01 0.30	0.10 <0.01 <0.05 <0.01 <0.01	0.01 <0.01
Cyanide Free	0.014 <0.01 0.13	0.27 0.095 0.10 12	0.064 0.032 0.037 2.0	0.020 <0.01 0.021
Cyanide Total	0.018 0.04 0.01 0.13 0.02 0.02 0.01	56.0 48.0 40.8 95 140 22 36.2 7.1 17	18.8 14.5 14.94 22.0 22.0 3.5 3.5 1.3	0.019 0.01 0.02 0.02 0.02 0.02 0.01 0.01
Specific Conductance (field)	210 215 210 210 540 550 365	6,000 2,750 6,900 5,800 6,000 3,900 7,2,000 1,865 1,865 1,865	2,825 2,700 3,100 2,400 2,050 1,318 1,340 1,340 1,219	700 750 680 680 890 760 11,500 670 670
Specific Specific Conductance (lab)	270 270 195 200 670 370 470	6,000 7,752 6,308 13,200 7,100 6,200 6,200 2,400 1,900 1,900	3,058 3,636 2,278 4,800 2,550 2,000 1,500 1,400 1,400	613 581 410 720 740 850 790 800 770
pH (field)	6.0 6.0 7.7 7.4 6.3 7.8 7.8 7.8 7.8	10.3 10.3 9.9 10.4 10.2 9.6 10.07 10.24 9.96	იციი დაი ფფ იციი დაი ფფ იციი და იცია იციი და იცია	6.04 5.05 5.05 6.04 6.04
pH (lab)	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10.3 10.5 10.5 10.4 10.0 10.0 9.98 9.98	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6.00 6.00 6.00 6.00 7.70 7.70 7.70 7.70
	MW-1 12/83 2/84 9/84 5/85 6/88 1/95 5/97	MW-2 12/83 2/84 9/84 5/85 10/85 7/88 2/90 1/95 5/97 5/97 5/98	MW-5 12/83 2/84 9/84 5/85 10/85 7/88 1/95 5/97 5/98 5/98	MW-7 12/83 2/84 9/84 5/85 6/88 1/95 5/97 5/97 (DUP) 5/98

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

Tetrachloroethene	<0.005		<0.005	<0.005
Vanadium	<0.0026 <0.01 <0.01 <0.01	<0.0026 <0.01 <0.01 <0.01	<0.0026 <0.01 <0.01 <0.01 <0.01	<0.0026 <0.01 <0.01 <0.01 <0.01
Sodium	202 199 216 151 111 67.8 50 80	195 106 88 53 28.7 26 26 26	238 232 213 181 78.5 30 33 31	24.3 23.8 29.0 27.7 27.7 24.4 23 19 20
Manganese	0.01 0.04 0.04 0.01 <0.01 0.02 0.08 0.12	0.26 0.26 0.05 0.05 0.001 0.01 0.01	0.06 0.37 0.21 0.13 0.227 0.40 0.42 0.45	0.94 0.71 0.61 1.00 1.23 1.5 1.5 1.5
lron	0.20 0.23 1.00 0.21 <0.01 <0.044	0.60 0.30 0.13 0.07 0.081 <0.04	0.48 7.9 4.90 2.68 0.071 <0.04	<0.01 0.02 <0.01 <0.01 <0.01 <0.04 <0.04
Beryllium	<0.0015 <0.01 <0.005 <0.0005	<0.0015 <0.001 <0.0005 <0.0005	< 0.0015< 0.0005< 0.0005< 0.0005	<0.0015 <0.01 <0.0005 <0.0005 <0.0005
Arsenic	0.0018 <0.004 <0.004 <0.004	0.0038 <0.004 <0.004 <0.008	0.0043 <0.004 <0.004 <0.004 <0.004	<0.0015 <0.004 <0.004 <0.008 <0.008
Fluoride	18 18 22 7.9 7.9 3.1 2.2 2.2	6.9 5.5 2.9 2.1 0.5 0.70	23 27 22 13 13 17 17 17	2.1 2.2 2.2 1.6 1.3 1.1 0.90 0.80
Cyanide Amenable	0.01 0.01 0.01 0.01	<0.01 0.02 0.01	6.00 6.00 6.00 6.00 6.00	<0.01 <0.01
Cyanide Free	0.017 0.013 0.024	0.083	0.021 0.015 0.026	0.021 <0.01 0.022
Cyanide Total	0.32 0.14 0.15 0.04 0.09 0.09 0.02	1.36 0.79 0.22 0.33 <0.01 <0.01	0.52 0.25 0.20 0.30 0.12 0.02 0.02	0.074 0.02 0.02 0.024 0.01 0.01 0.01 0.01 0.01
Specific Conductance (field)	700 700 800 550 550 930 442	1,280 800 675 710 750 560 510	825 775 800 650 650 565 680 404 507	400 385 375 375 390 515 515 550 422 550
Specific Specific Conductance (iab) (field)	820 820 820 661 830 550 560 610 560 490	1,205 820 847 800 770 800 670	980 962 656 750 570 530 590 500	476 476 366 540 494 510 530 540 470
pH (field)	9.2 9.5 9.0 9.2 8.3 7.8 7.60	7.6 7.5 6.5 7.0 7.2 6.8 7.4	9.4 9.5 9.5 9.5 7.9 7.57 7.57	7.3 7.2 6.3 7.4 7.5 7.7 7.7 7.43
pH (lab)	99.5 9.9 9.5 8.8 7.8 7.8 7.8	7.7 7.6 7.6 7.7 7.3 7.2 7.2	9.9 9.0 9.0 9.7 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7	7.5 7.5 7.7 7.7 7.5 7.4 7.4 7.5 7.57
	MW-8 12/83 2/84 9/84 9/84 5/85 5/86 5/97 5/97	MW-10 12/83 2/84 9/84 5/85 6/88 1/95 5/97	MW-11 12/83 2/84 9/84 5/85 6/88 1/95 5/97 5/98 5/98 (DUP)	12/83 12/83 12/84 9/84 9/84 5/85 6/86 6/88 1/95 5/97 5/98

Note: All results in mg/L unless otherwise noted.

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

Tetrachloroethene	<0.005	900.0	<0.005	0.022 0.006 0.024 0.014
Vanadium	0,0059 <0.01 <0.01 <0.01 <0.01	0.018 <0.01 <0.01 <0.01 <0.01	<0.0026 <0.01 <0.01 <0.01	0.191 0.02 0.01 0.05 0.05
Sodium	28.8 29.4 32.5 34.4 34.4 140 140 45	530 570 475 443 186 300 81 130 80	78 52 99 45.3 43.4 39.7 30 30	3,150 2,750 4,130 2,540 1,940 1,500 1,500 1,100 800
Manganese	0.03 0.01 0.01 0.117 0.02 0.02 0.05	0.91 1.44 0.5 1.09 0.22 1.1 1.2 1.2	1.38 1.77 1.27 1.80 1.93 1.72 1.9	0.26 0.50 0.35 1.06 1.75 0.19 0.29 0.29 0.29
lron	0.14 0.13 0.15 0.15 10.8 0.26	12.4 13.9 9.5 10.3 2.10 6.57 0.52	0.44 0.39 0.28 0.28 6.80 0.973 18	58.7 61. 103 64.2 71.4 110 56
Beryllium	0.0025 <0.01 <0.0005 <0.0005 <0.0005	 0.01 0.0015 0.0015 0.0005 0.0005 0.0005 	<0.01 <0.0015 <0.001 <0.0005 <0.0005	 <0.01 0.0071 <0.01 0.0006 0.0009 0.0014 0.00084
Arsenic	0.0045 <0.004 <0.004 <0.004 <0.004 <0.004	0.063 <0.004 <0.004 <0.004 <0.004 <0.004	0.0054 <0.004 <0.004	0.159 0.062 0.065 0.078 0.094
Fluoride	0.1 0.3 0.2/0.2 1.4 2.1 1.1 8.9 0.40	110 98 80 72 72 30 61 7.9 7.9 7.9 11	0464464666 9411191919	460 350 690 410 350 820 710 290 180 260 260
Cyanide Amenable	0.10/<0.01 0.12 0.20 0.40 0.02	<0.010.130.30.401.4	0.46 <0.005 <0.01 <0.09	25 10.5 6.6 <0.50 <0.01
Cyanide Free	0.018	0.034 <0.01 0.11 0.0	0.021 <0.01 0.045 0.43	0.19 0.091 12 <0.020
Cyanide Total	0.44 0.51 0.44 0.39 0.430 32 0.49 1.0 2.8 3.3	7.35 5.5 2.11 10.0 3.9 4.6 4.6 1.6 1.3 1.3	0.99 1.03 0.17 0.76 0.56 1.3 0.582 0.64	110.0 52.0 194 35.2 120 29 67.0 15 7.2 8.7 9.8
Specific Conductance (field)	435 435 445 600/600 613 731 731	1,800 1,550 10,500 1,400 1,410 930 941 801 760 790	475 470 550 470 475 640 420 488	8,750 7,500 10,000 7,000 11,400 >2,000 4,110 4,300 3,590
Specific Specific Conductance Conductance (lab) (field)	568 550 590 550 610/630 720 570 800 800	2,092 2,049 1,390 2,300 1,540 1,400 850 990 980 750	613 581 485 610 660 564 590 680 710 870	10,526 9,615 9,111 6,300 9,700 8,000 5,900 4,000 4,000 3,600
pH (field)	6.7 6.8 6.8 7.17.1 7.07 7.44 7.44 6.78	9.9 9.7 9.0 9.0 7.75 7.75 7.70 7.70	7.6 7.4 6.7 7.9 7.5 7.7 7.7 7.40	10.0 9.8 9.9 9.9 10.1 11.1 8.67 9.58 9.58
pH (lab)	6.9 6.9 7.4 7.1 7.07 7.0 6.8 6.8 6.99	9.8 9.7 9.8 9.8 9.4 9.4 7.7 7.3 7.7 7.70	7.08 7.09 9.7.7 7.7.7 7.5.7 6.00 6.00 6.00 7.00 7.00 7.00 8.00 8.00 8.00 8.00 8	9.9 9.8 9.9 9.0 10.0 10.0 9.7 9.7 9.7 9.7
	MW-15 12/83 2/84 5/85 5/86 7/88 1/95 7/96 5/97 5/97 5/98	MW-16 12/83 2/84 9/84 9/85 1/085 7/88 1/95 7/96 5/97 5/98	MW-17 12/83 2/84 9/84 9/84 5/85 1/0/85 6/88 2/90 1/95 5/97	MW-18 12/83 2/84 9/84 5/85 10/85 7/88 2/90 1/95 7/96 5/97 5/98

HydroSystems Management, Inc.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

pH (field)	Specific Specific Conductance (lab) (field)	Specific Conductance (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	Tetrachloroethene
	581 575 451	435 405 460	0.068	0.013		0.00 6.05 6.05			<0.01 0.05 0.02 45	0.54 0.04 0.04	22.9 23.5 23.5		
	630	260	0.01	<u> </u>	<0.01	0.5	0.0067	<0.0015	17.6	0.23	32.2 21.0	0.015	<0.005
	630 520 560	410 431 575	0.00		0.01 0.01	1.0 1.4	40.00440.00440.008	<0.01 <0.0005 <0.0005	0.09	60.01 60.01 60.01	24 18 23	0.00 0.00 0.01	
	382 640 500 440	665 700 429	0.89 7.4 0.74 0.26	0.08	0.6	<0.1 <0.1 2.7 0.50	<0.0015 <0.004 <0.004	<0.0015 <0.01 <0.005	0.36 2.41 0.38	0.02 0.035 0.02 0.01	41 83.3 79	<0.0026 <0.01 <0.01	<0.005
	590 500 540 540	453 550 527 527	0.11 0.12 0.11		<0.02 <0.01 0.11 0.11	0.20 0.27 0.27		<0.0005<0.0005<0.0005<0.0005		0.01 0.01 0.01	62 65 64 65	60.01 60.01 60.01	
	2,350 1,100 2,900 2,200 1,700	1,090 1,750 1,735 1,665	1.5 0.99 0.79 0.6 0.18	0.02	0.37 0.07 <0.1 <0.01	8 4 4 8 8 4 8 8 8 9 8 9 8 9 8 9 8 9 8 9	0.0052 <0.004 <0.004 <0.004	<0.0015 <0.01 <0.0005 <0.0005	0.64 1.52 0.37	0.08 0.094 0.12 0.14 0.09	590 224 590 410 370	0.0044 <0.01 <0.01 <0.01	<0.005
	648 590 650 600 550	570 770 479 560	0.31 0.25 0.22 0.18	0.01	<0.01 0.03 <0.02 <0.01	9.7 7.8 7.8 3.3 5.8	0.002 <0.004 <0.004 <0.004	<0.0015 <0.01 <0.0005 <0.0005	0.18 0.082 0.09	0.26 1.16 2.0 2	139 60.4 33 31 28	<0.0026 <0.01 <0.01 <0.01	<0.005
	342 340 430 390	400 570 334 418	0.01 0.01 0.01 <0.01	<0.01	<0.01 <0.01	0.5 <0.1 <0.1 <0.1 0.10	0.0018 <0.004 <0.004 <0.004	<0.0015 <0.01 <0.005 <0.005	<0.01 4.42 0.78	2.10 0.753 0.60 0.6	20 18.7 19 18	0.00 44 <0.01 <0.01 <0.01	0.005 0.012 0.013

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.) SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION GROUND-WATER MONITORING WELLS AND PARAMETERS

Tetrachloroethene	0.040	0.041	0.029	0.020	<0.005			<0.005	s S	<0.005		<0.005			
Vanadium	0.184	0.02 0.04	0.05	0.043	0.024	0.04 0.04 0.04	<0.01 60.01 70.01	0.018	<0.01 <0.01 NS	<0.0026	0.01 0.01 0.01	0.053	ç	0.03	0.02
Sodium	380 703 660	420	480 490 630	600	2120 234 230	110	78	33.1	4 & & X 2 & & X 2 & & & X	42	34 35 35	2,070	350	077	220 140
Manganese	3.67	0.66	1.1	<u> </u>	0.69 0.513	0.84	1.8	0.42 0.416	0.01 0.04 NS	0.55 0.762	0.82 0.79 0.68	1.76	5	0.5	0.68 0.92 0.88
lron	84.5 20.3	6.4 0.			27.4 4.05	i		0.07	0.18 NS	0.02	<0.04	125 56.5	25	=	
Beryllium	<0.0015	<0.01 0.0007 0.0007	0.0008	0.0013	<0.0015	<0.0005 <0.0005 <0.0005	<0.0005	<0.0015	<0.01 <0.0005 NS	<0.0015	<0.01 <0.0005 <0.0005	0.002	2	0.000	0.0006 <0.0005
Arsenic	0.046	0.027	0.038	0.045	0.014	0.008	<0.004 <0.004	0.0087	<0.004 <0.004 NS	0.0031	<0.004 <0.004 <0.004	0.147		0.028	0.02
Fluoride	46 140	931	93 100 130	130	369	19	13	7.3	8.7 8.1 NS	10.2	4.8.8. 9.0	358 400	71	3.5	27 4
Cyanide Amenable	<0.01 3 94	60.07	0.07	0.07	0.30 3.6	1.3	0.09	38	0.04 NS	<0.01	0.07 <0.01 0.01	4	<0.005	0.0	<1.0 2.9 0.99
Cyanide Free	1.5	<0.020			8	<0.020		<0.01	SZ	<0.01		38		0.040	
Cyanide Total	12 39 4 80	. 12	6.2 8.9 8.3	9.6	97 7.2 12	. 0. 4. 0 1 0. 4. 0	2.5 5.5 5.5	0.13	0.03 0.18 NS	0.05	0.05	240	8.0	6.0	16 15 16
Specific Conductance (field)	3,500	2,100 2,100 100	2,100	2,520	1,040	1,038 697 697	697	670	740 430 579 NS	580	400 492 595	6,150	1,540	1,851	900
Specific Specific Conductance Conductance (lab) (field)	1,250 3,400	2,300	2,500	2,700	6430 890	1,000 930 630	092	899 069	700 710 NS	602 560	640 630 590	6,430 6,100	1,500	1,700	1,000 710 550
pH (field)	10.5 9.95	9.52 9.52 9.69	08.0 08.0 08.0 08.0	98.6	6. g	8.89 8.71 8.71	8.10 8.26	7.2	7.1 7.43 NS	4.7	7.4 7.43 7.23	10.4	9.7	9.5	9.47 9.10 8.90
pH (lab)	9.1	වේ ග් ග් ග්	9.9 9.63	9.67	10.5 9.2	8.6 8.7 8.03	8.30	4.7.	4. 2. 4. N	7.3	7.3 7.4 7.37	10.2	9.6	. 6 . 5	9.4 8.93 8.97
	5/86 5/86 6/88	1/95 7/96 5/97	5/97 (DUP) 5/98 9/98	9/98 (DUP)	5/86 7/88	5/97	5/98 (DUP) 9/98	MW-34S 5/86 7/88	2/90 1/95 5/97 5/98	MW-34D 5/86 7/88	1/95 5/97 5/98	MW-35 5/86 7/88	2/90	96/2	5/97 5/98 9/98

Note: All results in mg/L unless otherwise noted.

TABLE 4 (CONT.) SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION HANNIBAL, OHIO

Tetrachloroethene	<0.005		SZ	<0.005		<0.005	<0.005	<0.005	<0.005	
Vanadium		0.07	0.1 NS 0.074	0.369	0.01 0.03 0.02 0.02 0.017	0.053 <0.01 <0.01	<0.0026 <0.01 <0.01 <0.01	0.0056 <0.01 <0.01 <0.01	0.012 <0.01 <0.01	<a>0.01 <a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.01<a>0.
Sodium	760	0//	850 NS 990	1,800 1,470 970	280 210 120 140	2780 826 520 1300 700	103 53.9 36 32 34	650 445 470 380 270	280 258 340 340	22 21 21
Manganese	1.13	0.83	1.7 NS 1.4	46.3 15.4	0.58 0.51 0.56 0.28 0.53	1.35 1.63 0.22 0.15 0.11	0.54 0.681 0.87 0.87 0.77	0.49 0.139 0.33 0.66 0.13	0.62 0.454 0.74 1.3 0.36	£ 7 F.
lron	39.5 3.52	8.7	S Z	498 115 1000	න ය	25.0 36.6 0.36	0.14 0.36 0.06	12.8 1.89 0.36	11.7 7.81 0.29	თ. ზ
Beryllium	<0.0015	<0.01 0.0021	0.0035 NS 0.0036	0.035	<0.01 0.0005 <0.0005 <0.0005	<0.0015 <0.01 <0.0005 <0.0005	<0.0015 <0.01 <0.0005 <0.0005	<0.0015 <0.01 <0.0005 <0.0005	<0.0015 <0.001 <0.0005 <0.0005	<0.01 <0.0005 <0.0005
Arsenic	0.0078	0.034	0.084 NS 0.11	0.169	0.033 0.042 0.027 0.018 0.020	0.016 <0.004 0.009 0.009	0.0021 <0.004 <0.004 <0.004	0.018 <0.004 <0.004 <0.004	0.018 <0.004 <0.004 <0.004	0.017 0.022 0.016
Fluoride	97	160	180 NS 230	890 1000 360	87 45 53 6.8	244 110 59 150 98	7.4 6.1 9.8 9.8	28 5.9 40 21	20 36 16 7.6	0.2 0.20 0.30
Cyanide Amenable	1.3	<0.01	3.5 NS 0.03	<0.01 22.7	<0.01 1.7 <0.01 5.5	0.10 <0.01 <0.2 <0.01	0.03 <0.01 0.06 <0.01	<0.01 <0.01 0.40 <0.01	<0.01 <0.01 <0.1 0.47	0.02
Cyanide Free	1.4	<0.020	SN	8.2	<0.020	2.9	0.02	0.03	90.0	
Cyanide Total	25 8.6	8.1	9. 8.8 8.5	97 0.30 4.6	8 4 1 4 5 4 5 4 5	11 3.8 0.64 3.6 2.3	0.21 0.17 0.07 0.06 0.04	1.7 1.5 0.87 0.72 0.36	7.4 7.0 0.70 0.59 0.49	0.04 <0.01 <0.01
Specific Conductance (field)	1,255	1,350 3,280	3,290 NS 4,380	5,500 3,100	970 832 846 505 682	2,550 900 5,500 4,000	595 410 457 560	2,200 1,600 1,417 1,335	1,290 1,375 1,350 1,250	600 357 449
Specific Specific Conductance Conductance (lab) (field)	2,700	3,500 3,300	3,600 NS 4,500	7,340 5,600 2,700	1,200 570 1,100 530 670	8,360 3,500 2,700 5,500	627 590 630 630 590	2,550 2,100 2,500 1,900	1,120 1,200 2,000 1,800	490 490 420
pH (field)	9.6	9.7	9.64 NS 10.10	9.8 9.65	9.2 8.89 9.07 8.30 8.26	9.7 9.2 9.09	7.8 7.6 7.66 7.35	9.2 7.9 8.07 8.18	9.4 7.7 7.9 7.73	8.2 6.98 6.74
pH (lab)			9.8 8.90		9.1 9.2 8.57 8.90	ი ი ი ი ი ი ი ი ი ა 4	8.1 7.9 7.5 7.5	8.00 7.00 7.00 8.20	9.4 9.4 7.6 7.85	6.6 6.8 6.67
	MW-36 5/86 7/88	1/95	5/97 5/98 9/98	MW-37 5/86 7/88 2/90	1/95 7/96 5/97 5/98 9/98	MW-39S 5/86 6/88 1/95 5/97 5/98	MW-39D 5/86 6/88 1/95 5/97 5/98	MW-40S 5/86 6/88 1/95 5/97 5/98	MW-40D 5/86 6/88 1/95 5/97 5/98	MW-41 1/95 5/97 5/98

NS = Not sampled. Well damaged during remedial construction. HydroSystems Management, Inc. Note: All results in mg/L unless otherwise noted.

HydroSystems Management, Inc.

TABLE 4 (CONT.)
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUND-WATER MONITORING WELLS AND PARAMETERS

ORMET CORPORATION HANNIBAL, OHIO

Tetrachloroethene		<0.005						<0.005			
Vanadium		0.0027		<0.01	<0.01	<0.01		0.0028	×0 01	<0.01	<0.01
Sodium		143	520	280	300	270		68 6	6	27	26
Manganese		0.237	!	0.35	0.33	0.37		0 636	5	13	1.2
lron		0.232	0.88	0.2	!			111	0.08	:	
Beryllium		<0.0015		<0.01	<0.0005	<0.0005		<0.0015	<0.01	<0.0005	<0.0005
Arsenic		0.002		<0.004	<0.004	<0.004		0.0028	<0.004	<0.004	<0.008
Fluoride		14.0	35.0	22	58	27		0.9	3.6	3.2	3.3
Cyanide Amenable		0.25	0.079	<0.01	<0.02	<0.01		<0.01	<0.01	<0.01	0.01
Cyanide Free											
Cyanide Total		0.70	0.266	0.45	0.56	0.52		0.16	0.04	0.04	0.07
Specific Ce Conductance C		870	2,400	765	1,350	1,460		009	410	468	535
Specific S Conductance Con (lab)		930	2,100	1,600	1,700	1,400		550	640	280	550
pH (field)		4.6	8.25	8.4	8.57	8.46		8.1	7.7	7.99	7.64
pH (lab)		8.0	8.4	8.2	8.2	8.26		7.9	7.5	7.6	7.54
	MW-42S	88/9	2/90	1/95	26/9	2/98	MW 42D	6/88	1/95	26/9	5/98

Note: All results in mg/L unless otherwise noted.

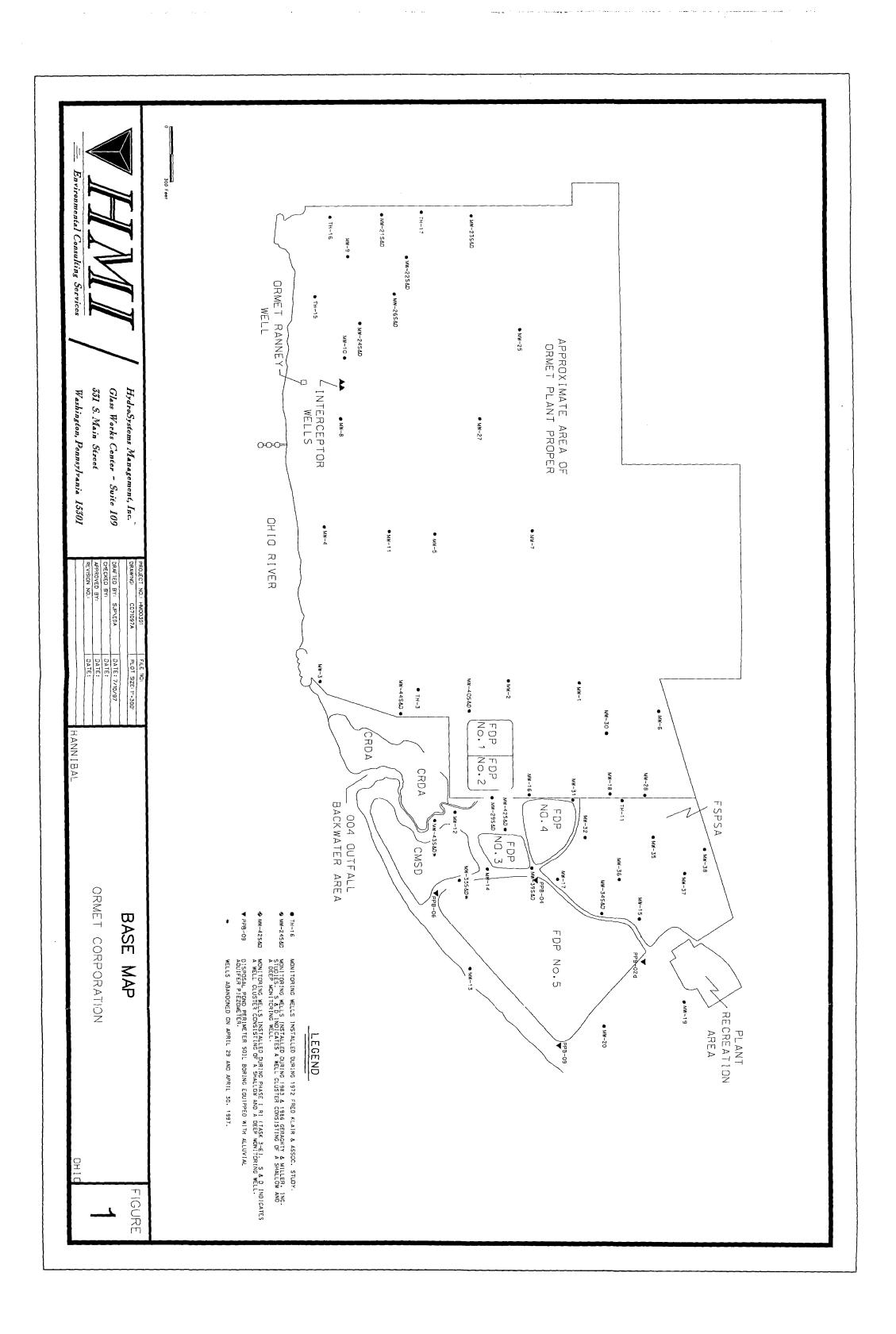
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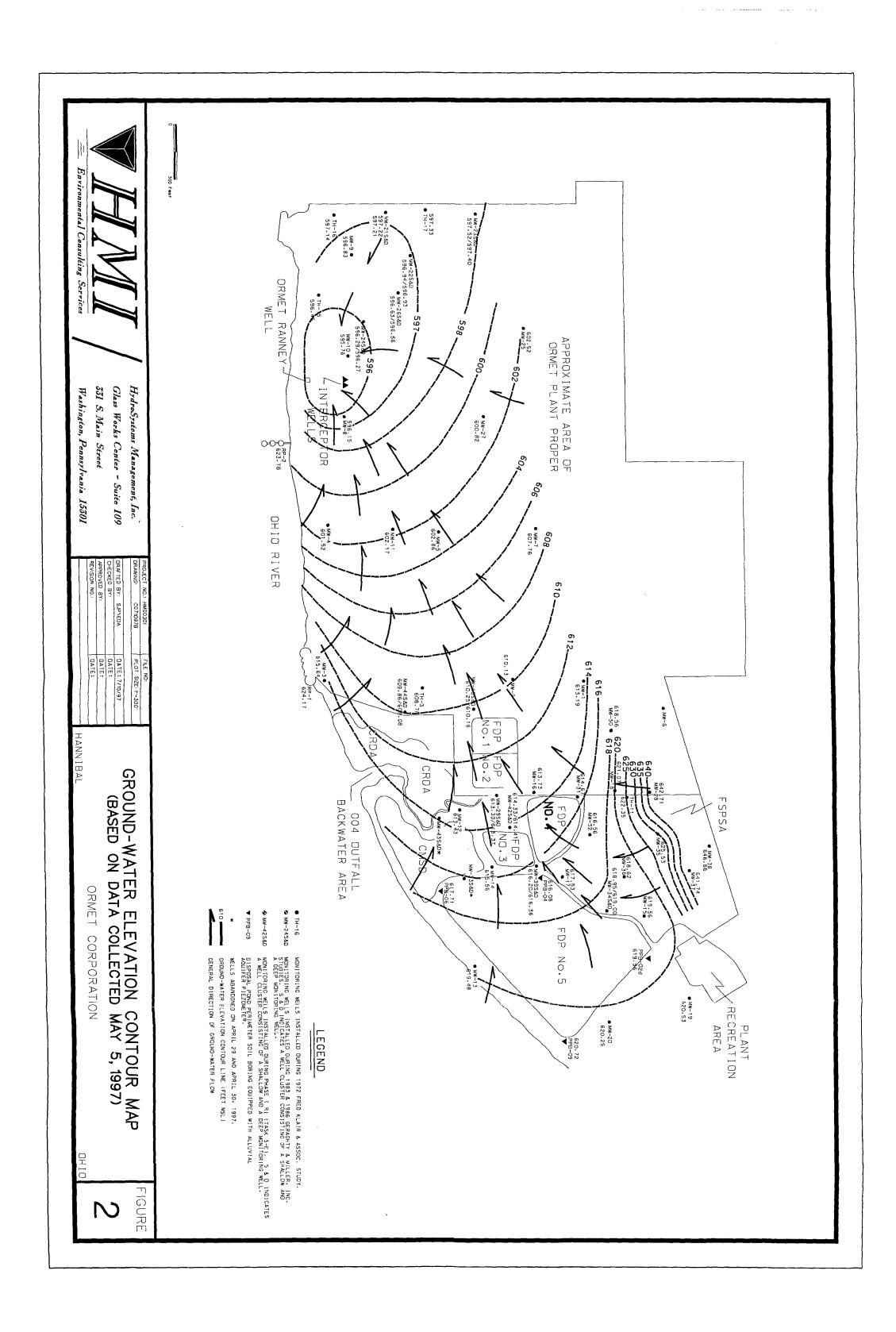
HydroSystems Management, Inc.

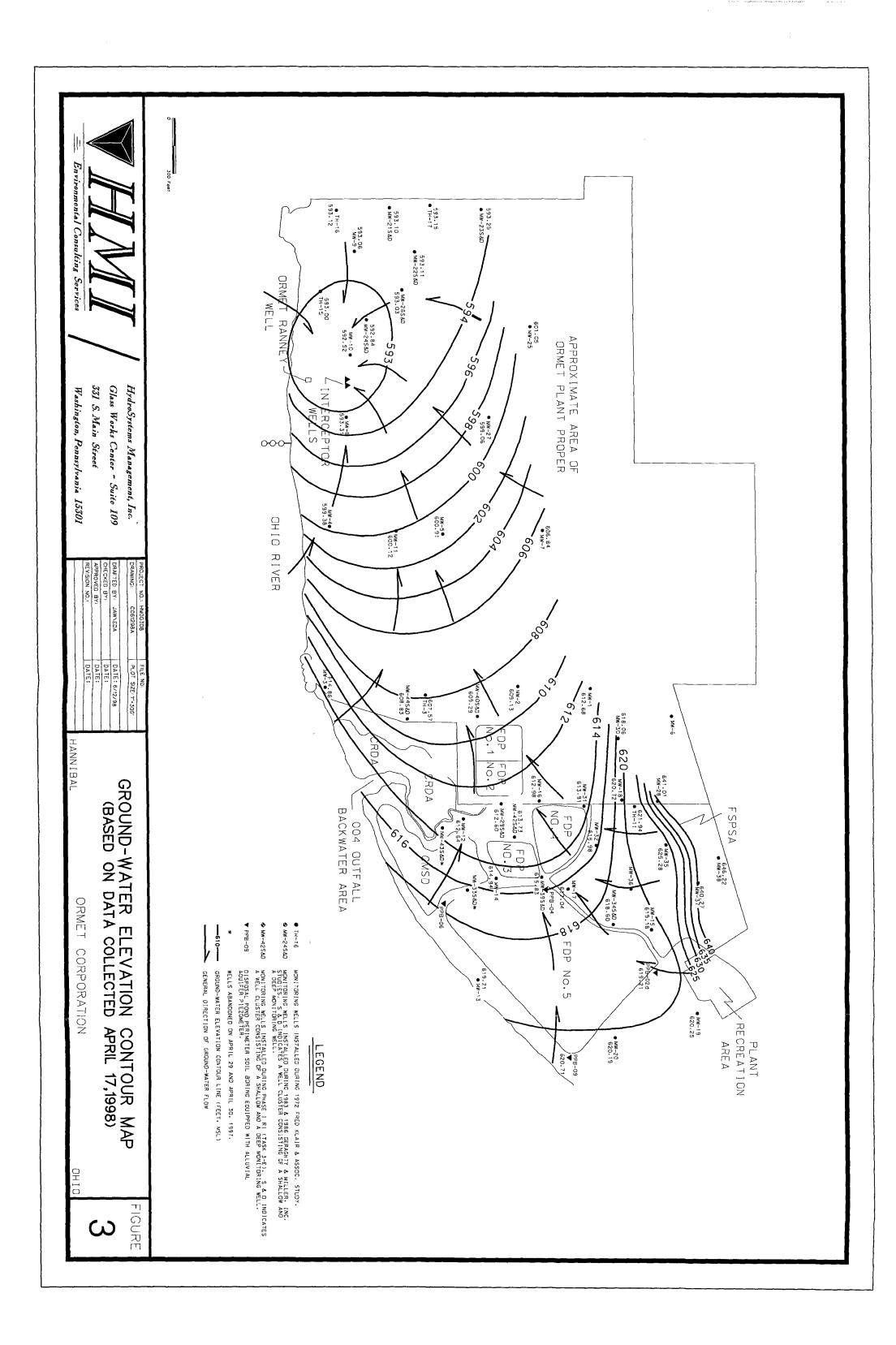
TABLE 5
SUMMARY OF ESTIMATED AQUIFER AREAS ABOVE CLEANUP GOALS
AND CONTAMINANT MASS-IN-PLACE
ORMET CORPORATION
HANNIBAL REDUCTION DIVISION
HANNIBAL, OHIO

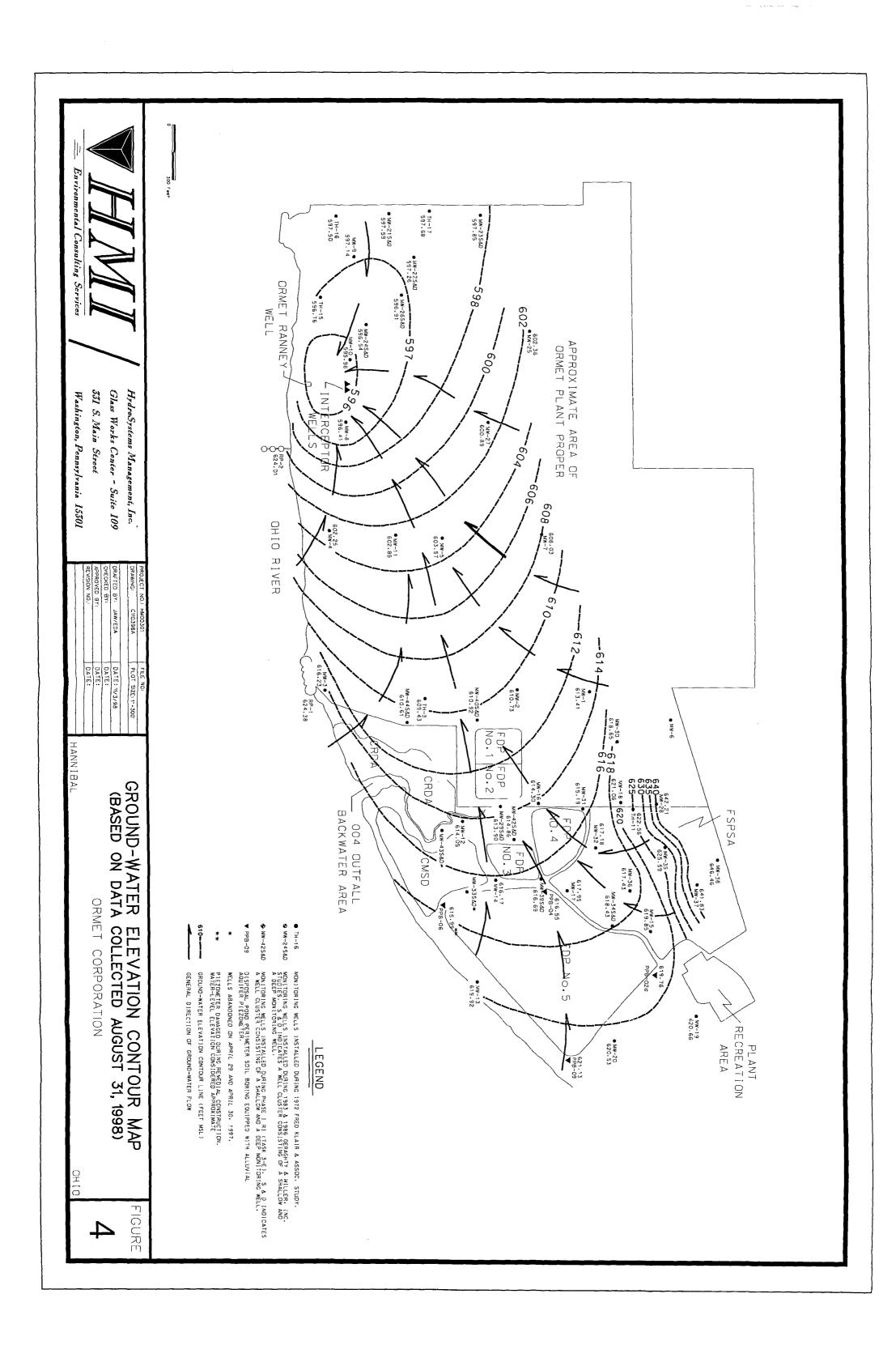
Sampling	Estimated Area of Aquifer		Estimated Area of Aquifer	
Date	Above 4 mg/L Fluoride	% Change	Above 0.2 mg/L Amenable CN	% Change
88/9	43.32 a.		24.53 a.	
1/95	48.36 a.	+11.6	5.93 a.	-75.8
2/87	43.67 a.	-9.7	21.30 a.	+259
5/98	36.85 a.	-15.6	10.52 а.	-50.6

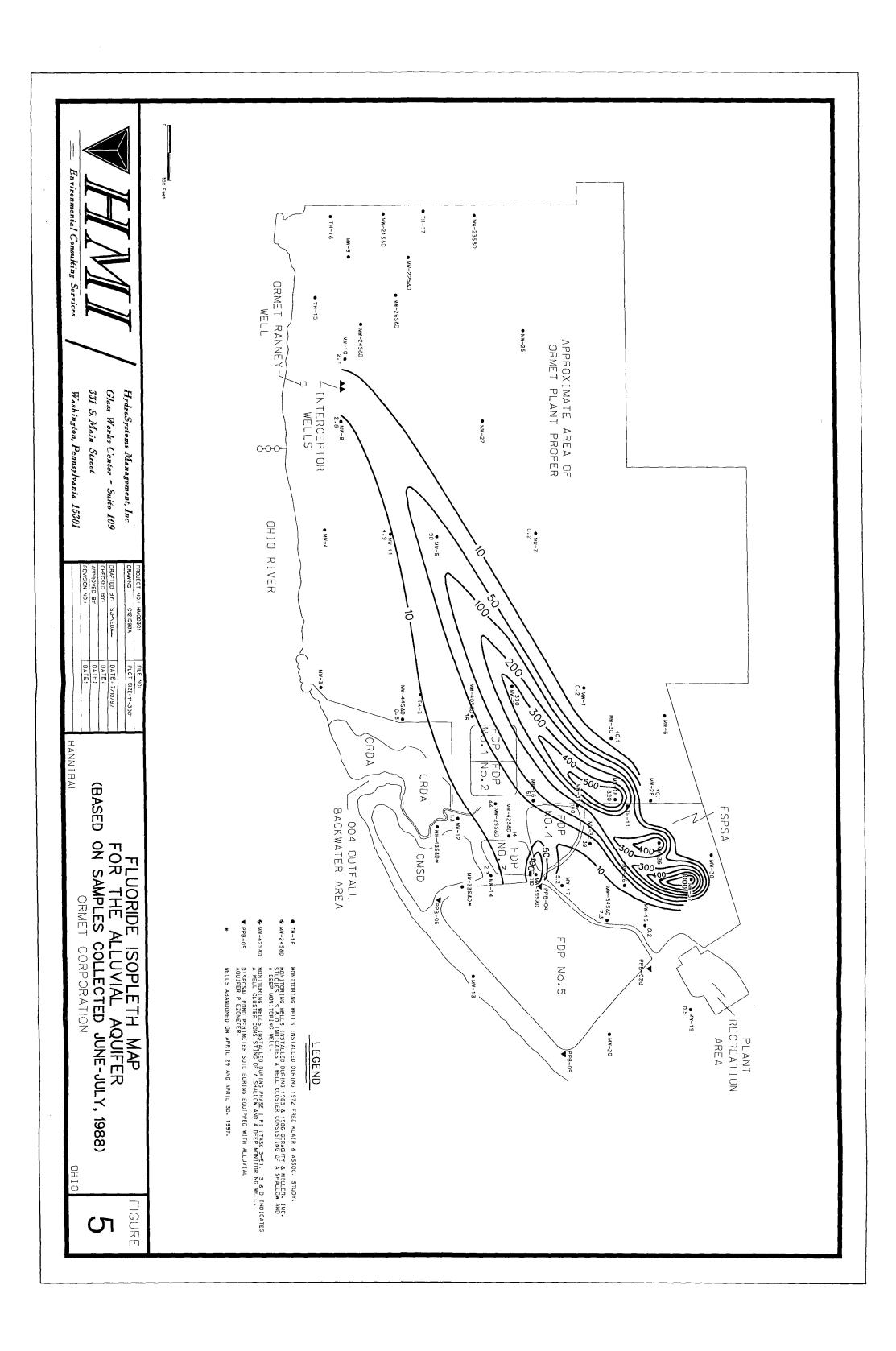
Sampling	Estimated Fluoride		Estimated Total CN	
Date	Mass-in-Place	% Change	Mass-in-Place	% Change
6/88	85,702 lbs.		6,821 lbs.	
1/95	28,168 lbs.	-67.1	4,271 lbs.	-37.4
2/97	29,033 lbs.	+3.1	2,943 lbs.	-31.1
5/98	23,888 lbs.	-17.7	2,597 lbs.	-11.8

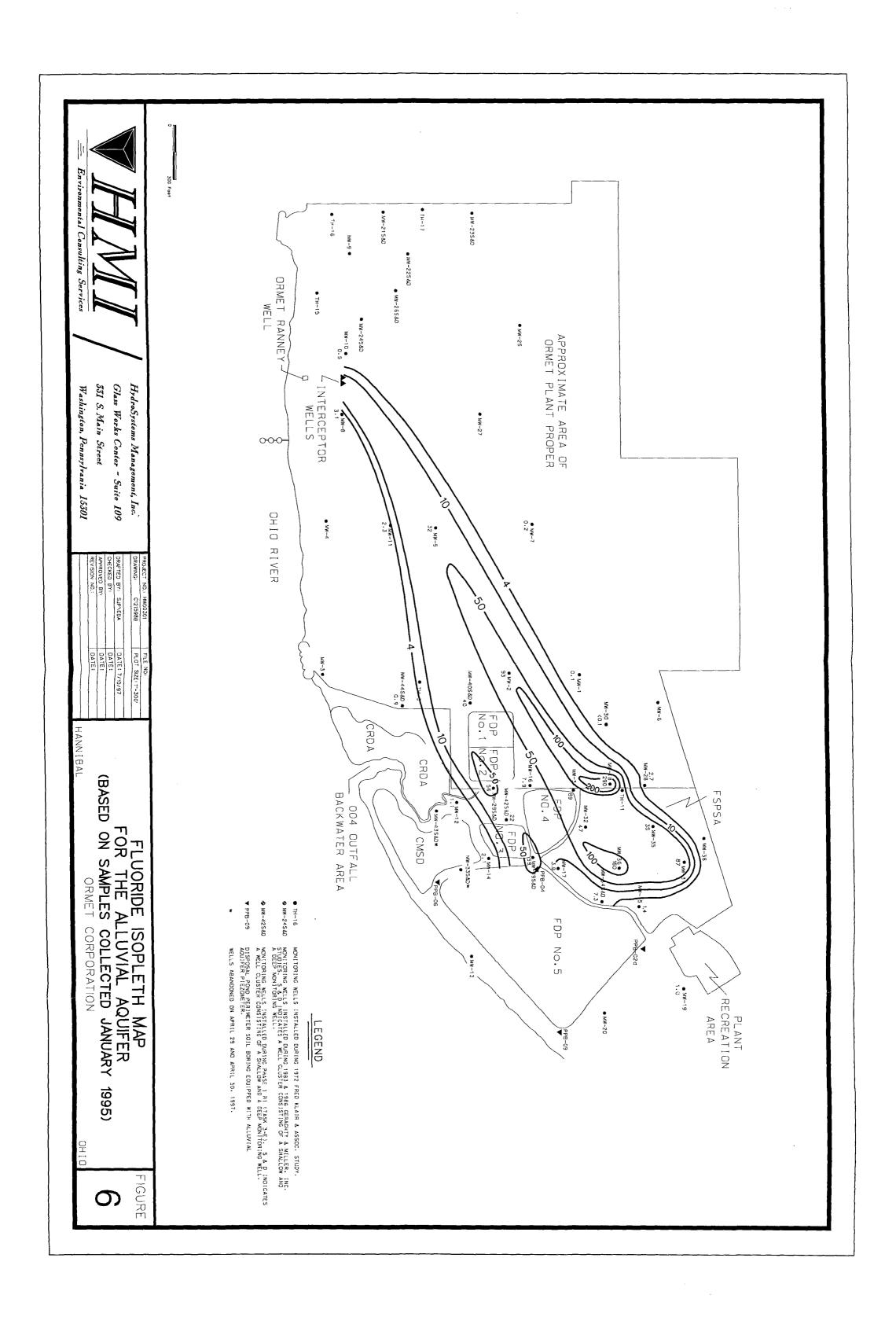


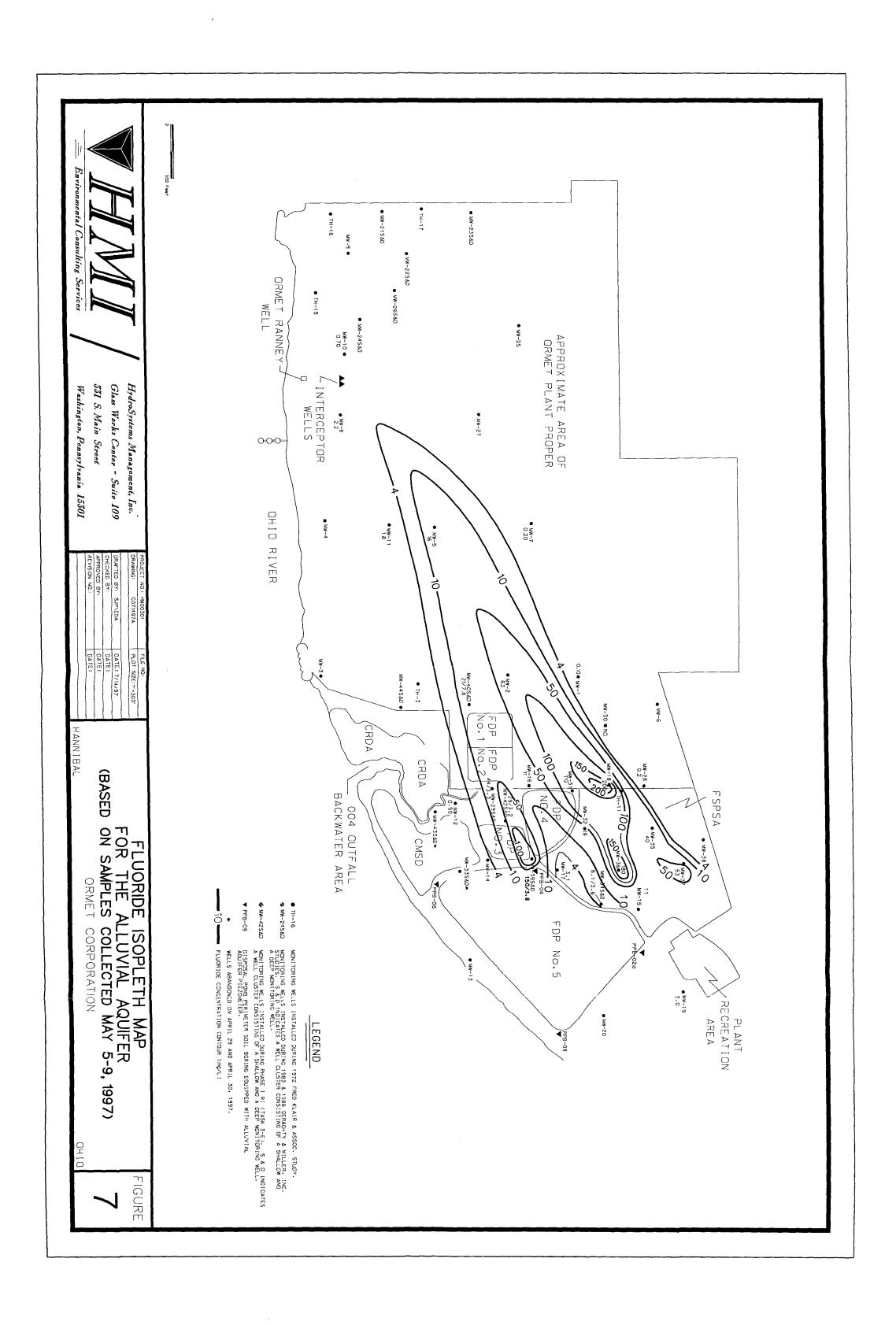


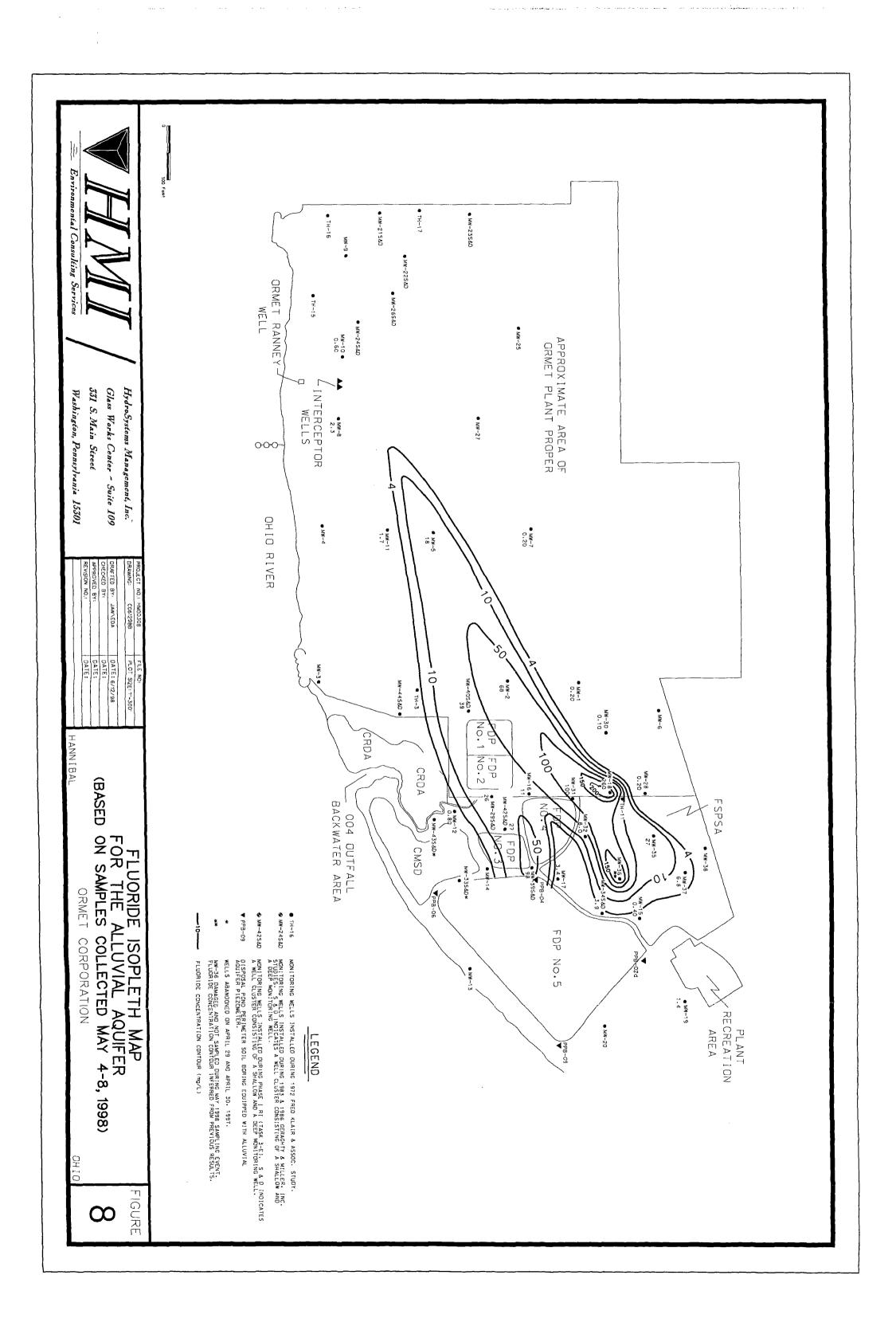


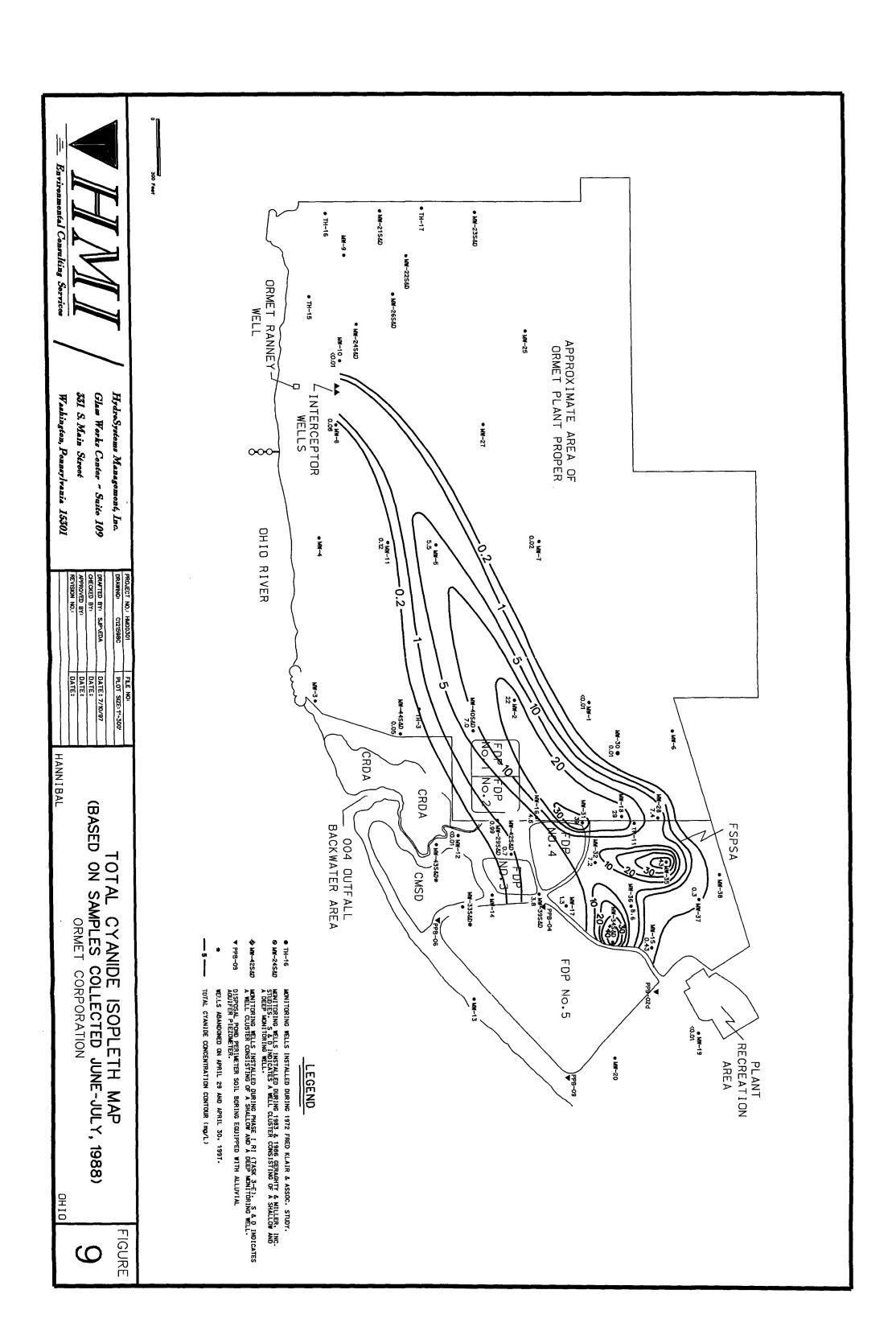


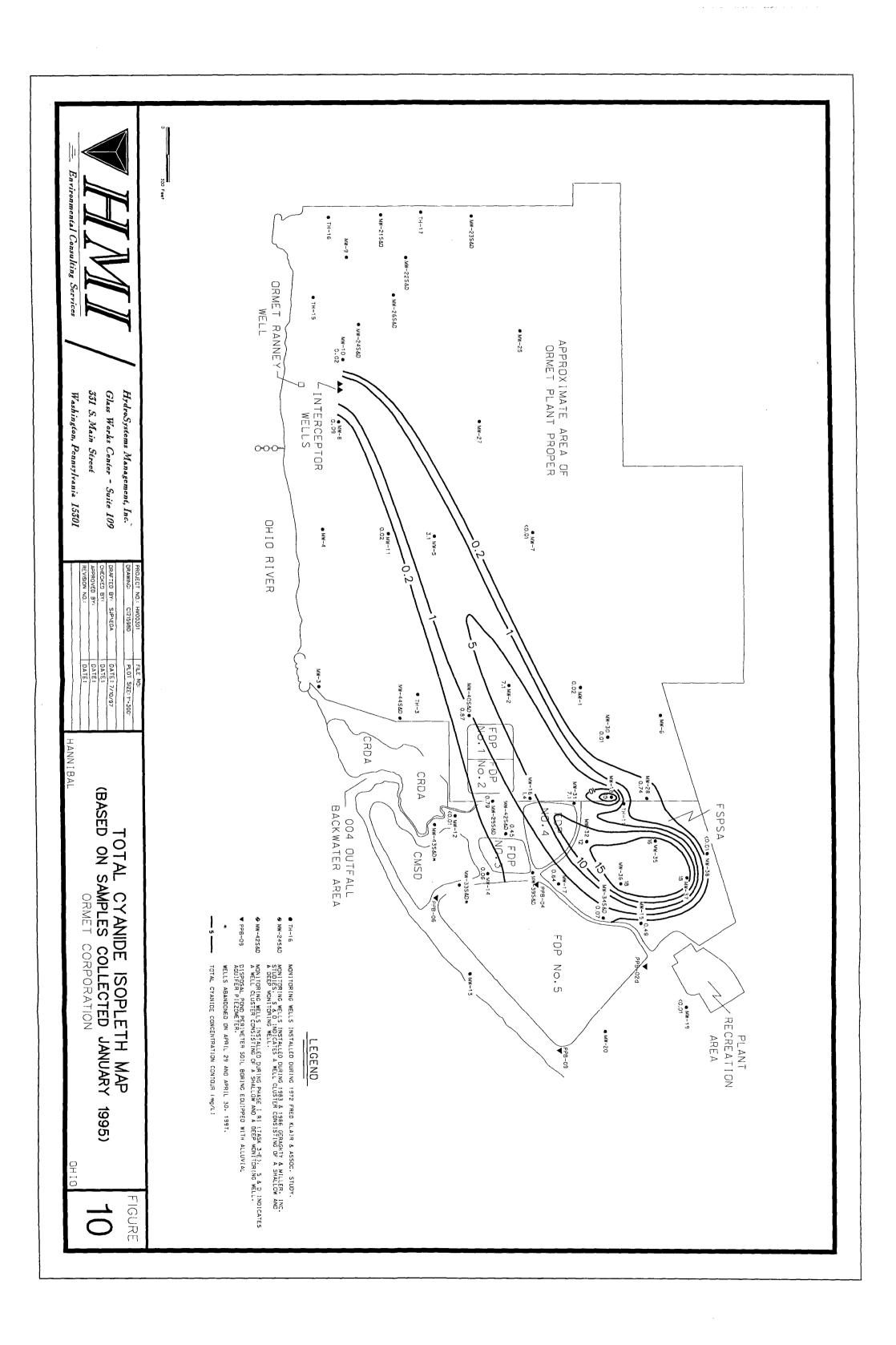


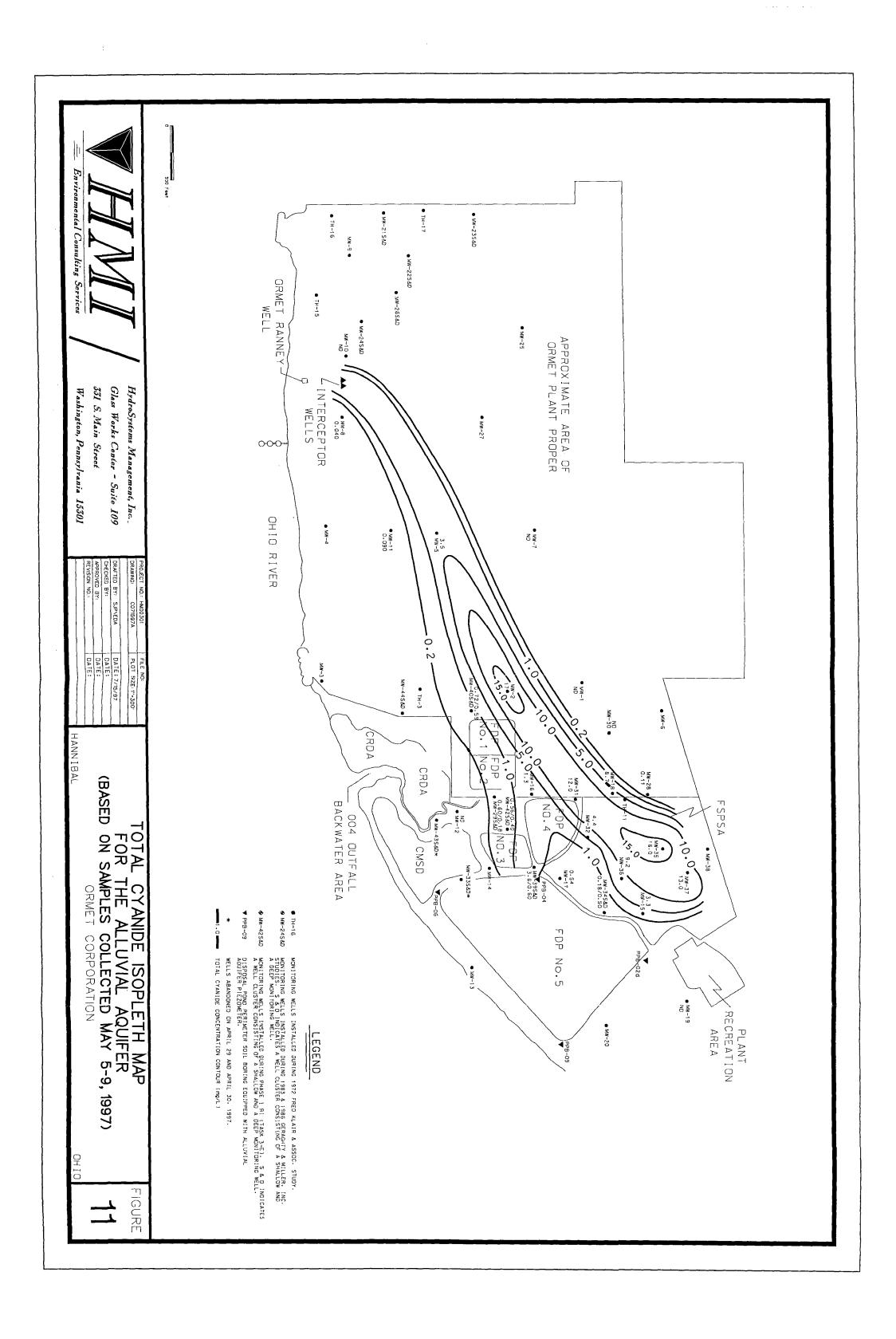


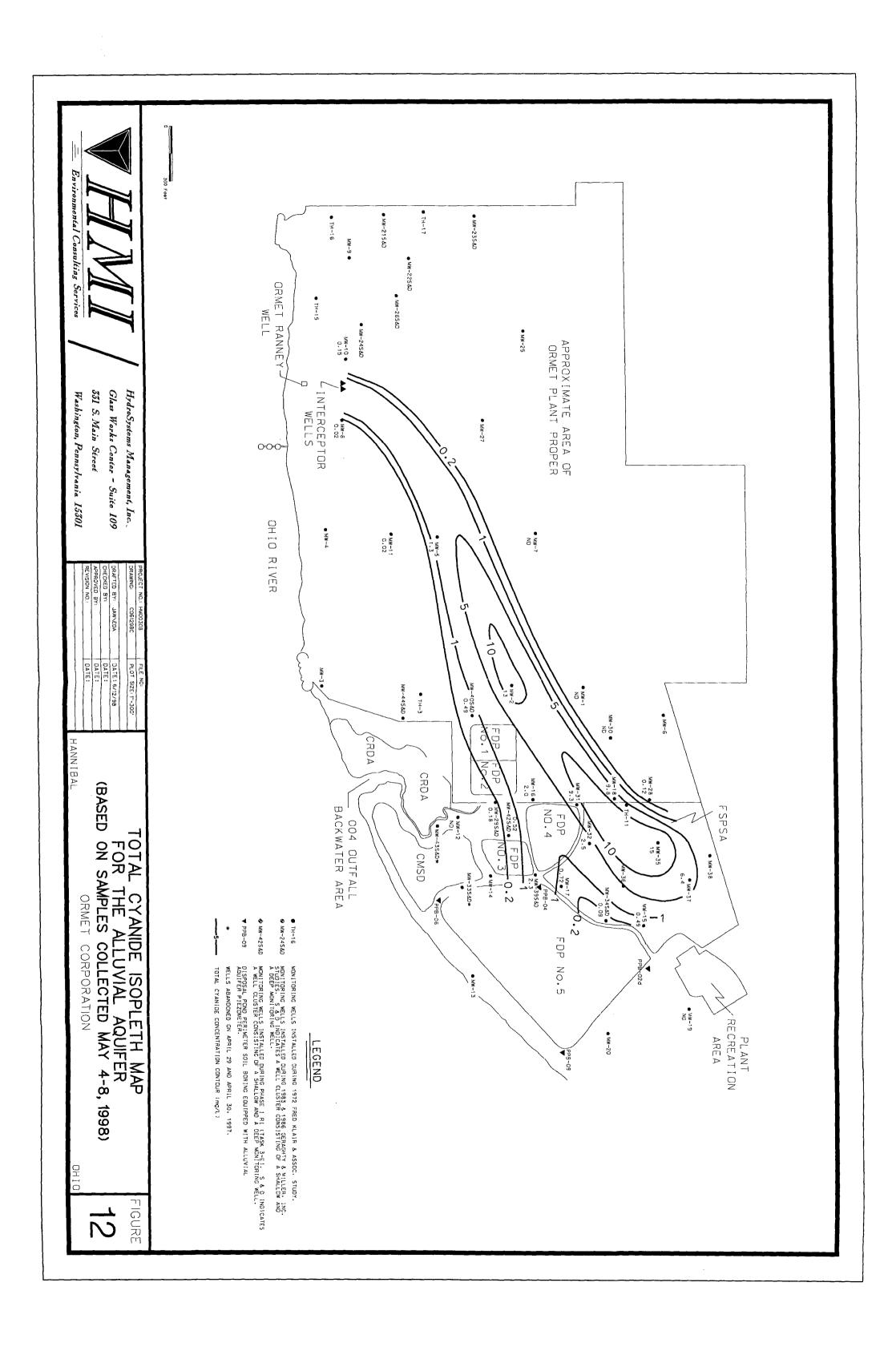


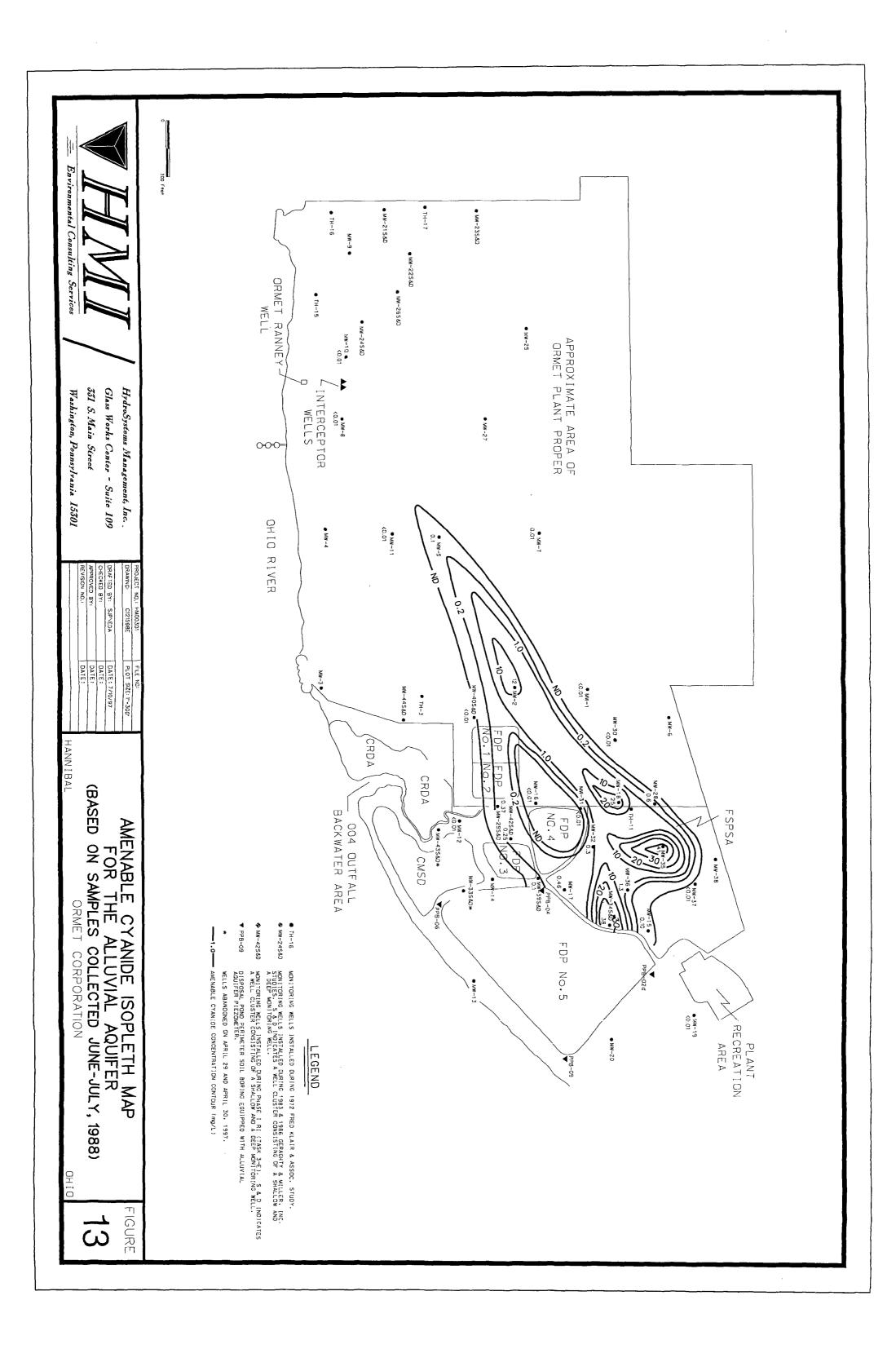


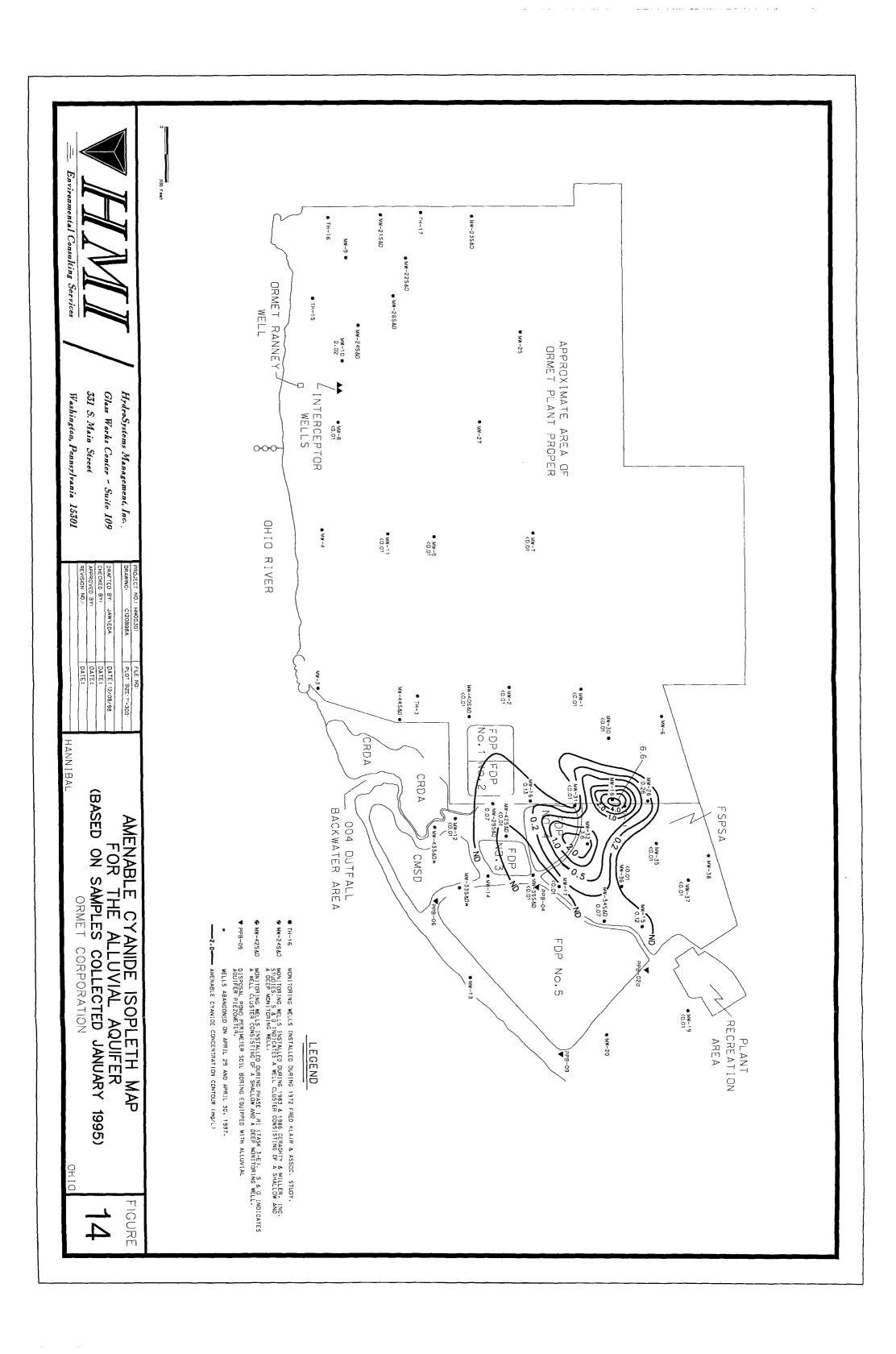


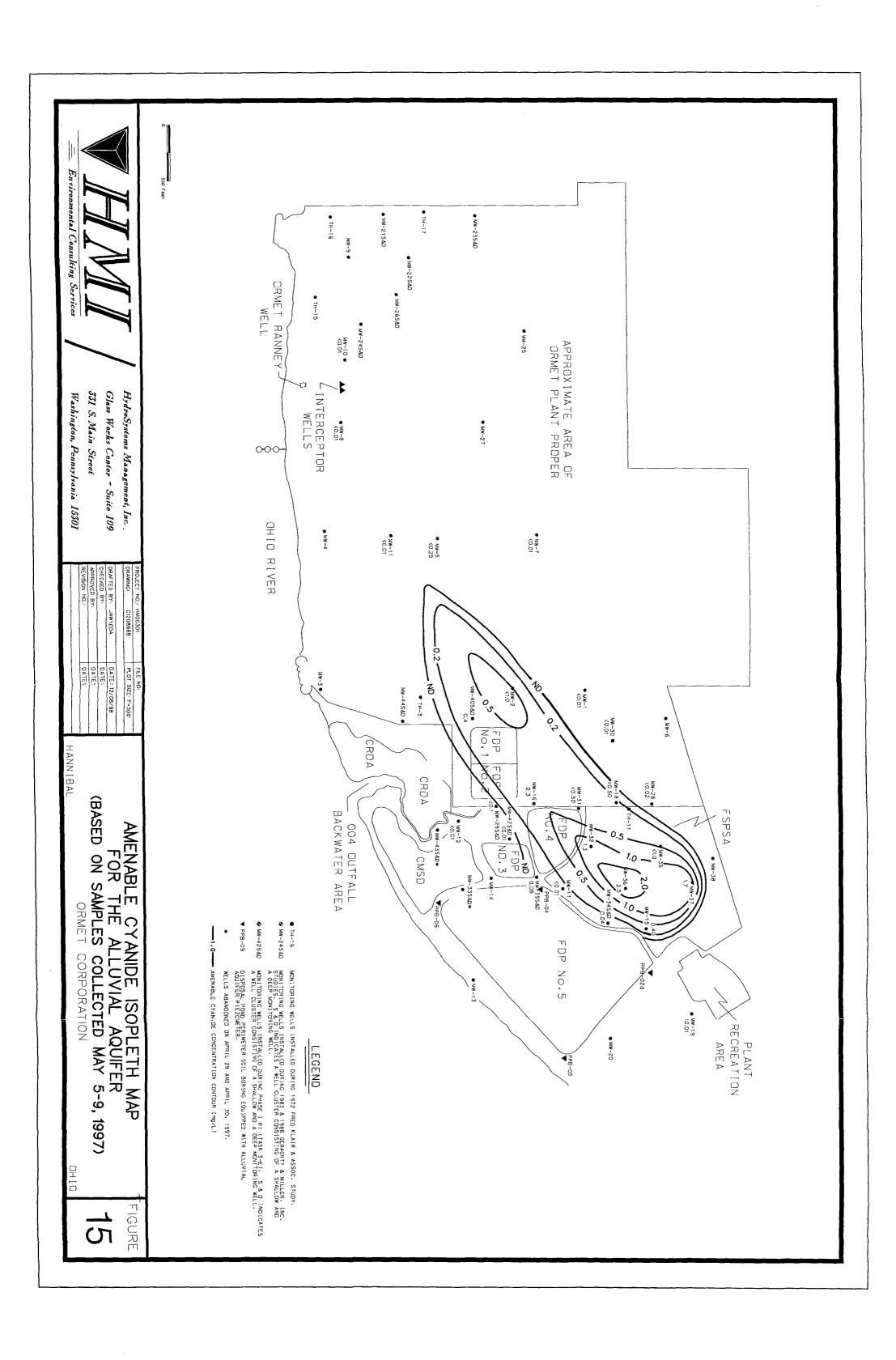


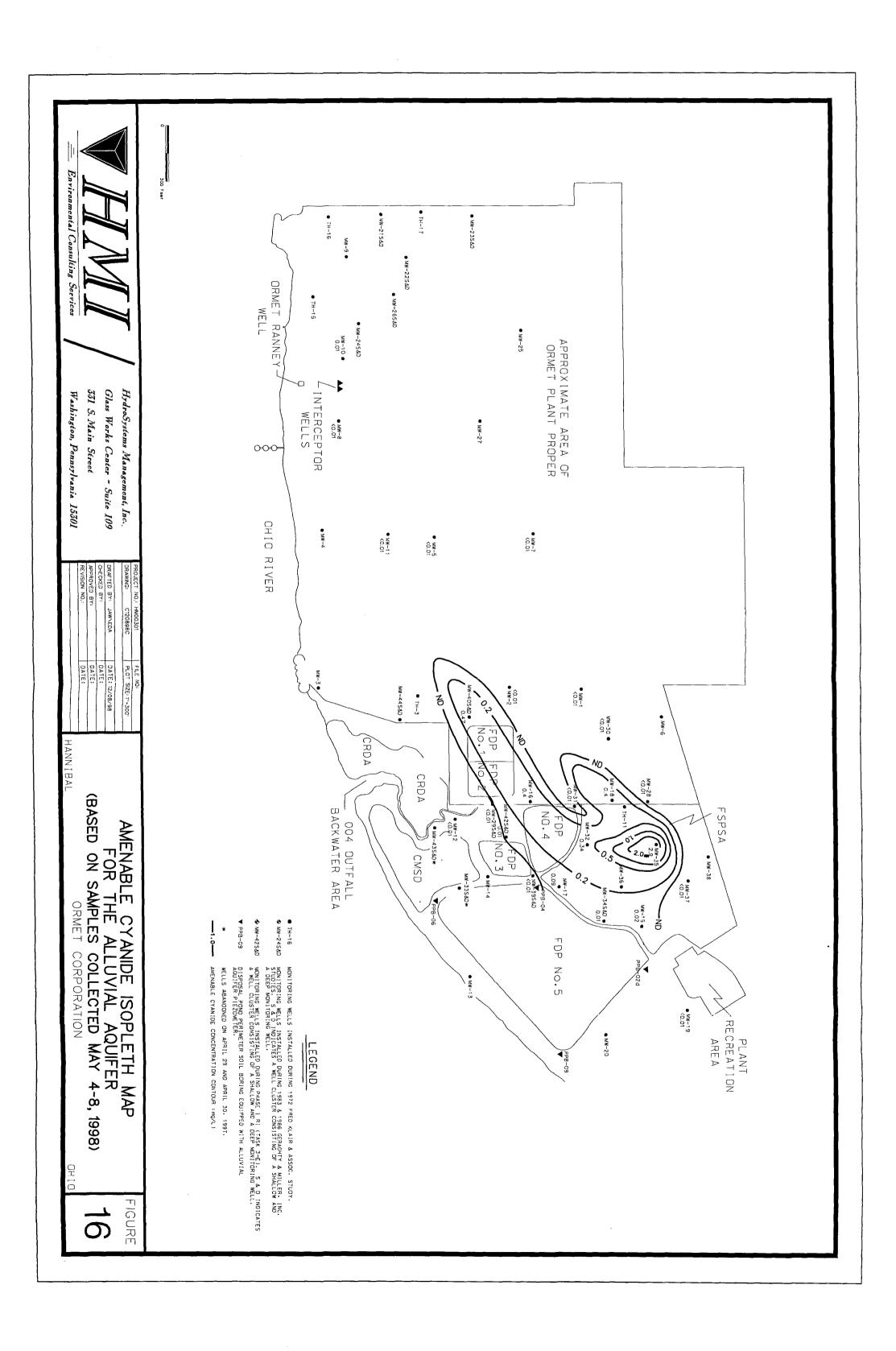


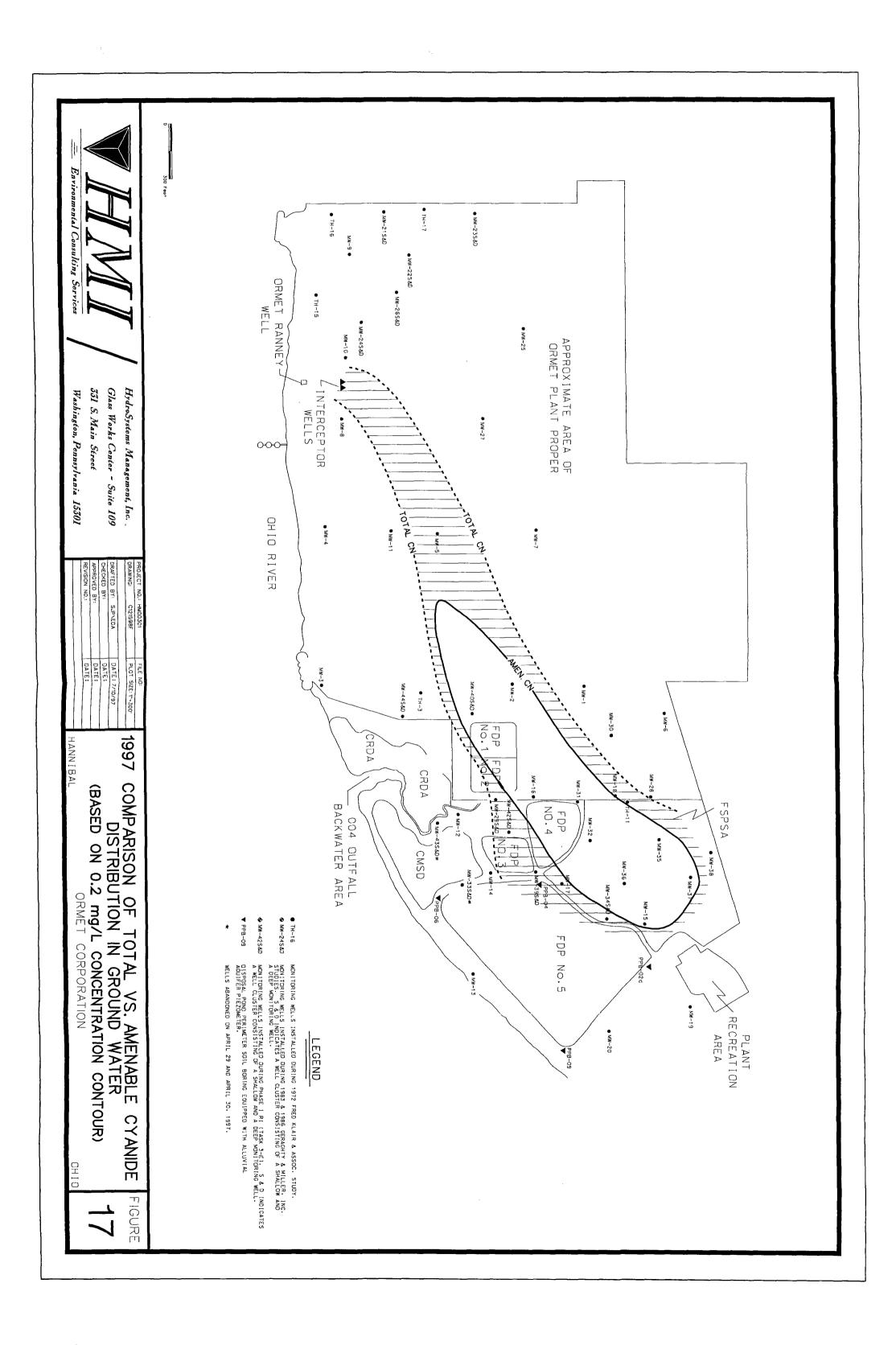


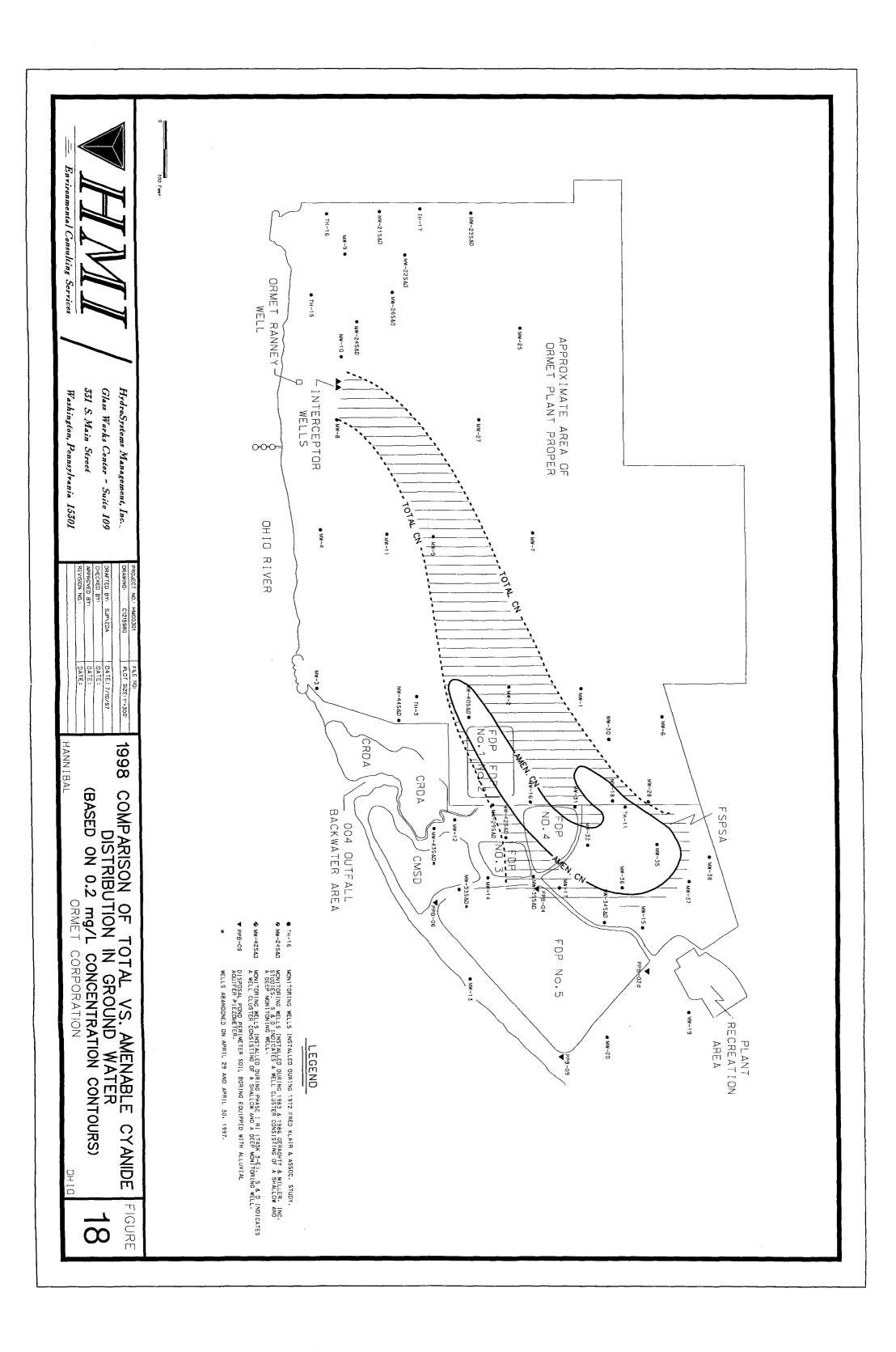












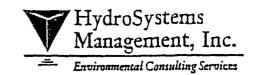
APPENDIX A

WATER SAMPLING LOG FORMS

Appendix A-1	Water Sampling Log Forms for May 1997 Monitoring Event	
Appendix A-2	Water Sampling Log Forms for May 1998 Monitoring Event	
Appendix A-3	Water Sampling Log Forms for August/September 1998 Monitoring Eve	nt

APPENDIX A-1

WATER SAMPLING LOG FORMS FOR MAY 1997 MONITORING EVENT

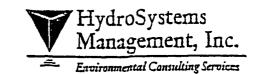


		. mu	v-36,37,91
PROJECT NO:	Hm003.07	WELL(S): mu	3 -15,17,32,343,34d, 35
LOCATION:	Ormet / Hannibal Ohio	DATE:	
SAMPLING PERSONNEL	J Campbell C Standard	TIME:	
COMPLETED BY:			

ITEMS	OK	NA	NOTES
PRIOR TO SAMPLING			
Health & safety plan; reviewed; equipment ready.	V		
Sample containers, coolers, received from laboratory (ica or ice			
pack and coolers ready.			• "
Sampling equipment and supplies inventoried, clean and			
operational.			
On - site client contact notified.	~		
Candition of well noted.	-		
Well area prepared for sampling; plastic placed around well;			
gasoline – powered pumps placed downwind.	V		
Water - level measurements made and recorded on	_		
Water Sampling Log with other pertinent field information.			
Field instruments calibrated; calibration recorded in field logbook	-		ph 4.0, 7.0+10.0 Spc 700+3400 pmhcs/cm
Sample containers labelled; preservatives added, if necessary.	~		By Lab
DURING AND AFTER SAMPLING:			3x if 10% stabilization of pH+SpL
Three to five well volumes purged.	1		sx max; if dryes sample upon
Sample collected using a bailer or pump as per sampling plan.	~		disposable bailer
Measurement of field parameters recorded on Water Sampling			
Log and in field log book.	1		
Sample containers filled according to collection protocol of	, _		
analyses.		-	
Field and trip blanks collected; replicates or split samples	ار. ا		mw-15 (mw-DUP-1)
collected and recorded in field log book.			
Samples stored on ice in coolers.	1		
Water Sampling Log and Chain-of-Custody Recorded completed	1		
Reusable equipment decontaminated; non-reusable equipment	1,_		
disposed of in appropriate manner.	_		
Well secured and locked.	1		

Additional Comments: Kennon Lab Courier picked up Samples

Orginal to Field Project File; copy to Project Manager and to QA Officer.

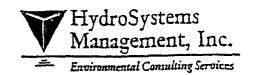


		n	w-40s,40d,29d
PROJECT NO:	Hm003.07	WELL(S):M	w-395,39d, Q, 425,42d, 19
LOCATION:	Ormet / Hannibal Ohio	DATE:	<i>5-7-97</i>
SAMPLING PERSONNEL	J campbell C Standard	TIME:	
COMPLETED BY:	J Campbell		

ITEMS	OK	NA	NOTES
PRIOR TO SAMPLING			
Health & safety plan; reviewed; equipment ready.	V	-	
Sample containers, coolers, received from laboratory ice or ice			
pack and coolers ready.		_	. "
Sampling equipment and supplies inventoried, clean and			
operational.		i	
On - site client contact notified.	~		
Condition of well noted.	~		
Well area prepared for sampling; plastic placed around well;			
gasoline - powered pumps placed downwind.	V		
Water-level measurements made and recorded on			
Water Sampling Log with other pertinent field information.			·
Field instruments calibrated; calibration recorded in field logbook	-		ph 4.0, 7.0+10.0 SDC 700+3900 pmhcs/cm
Sample containers labelled; preservatives added, if necessary.	<u></u>		By Lab
DURING AND AFTER SAMPLING:			3x if 10% stabilization of pH+SpC
Three to five well volumes purged.	L		sx max; if dryes sample upon
Sample collected using a bailer or pump as per sampling plan.	~		disposable bailer
Measurement of field parameters recorded on Water Sampling			
Log and in field log book.			
Sample containers filled according to collection protocol of	,		
anaiyses.		•	
Field and trip blanks collected; replicates or split samples			
collected and recorded in field log book.			
Samples stored on ice in coolers.			
Water Sampling Log and Chain - of - Custody Recorded completed	1		
Reusable equipment decontaminated; non-reusable equipment	ا ا	1.44	
disposed of in appropriate manner.			
Well secured and locked.	1	} .	

Additional Comments: Kennon Lab Courier picked up Samples

Orginal to Field Project File; copy to Project Manager and to QA Officer.



PROJECT NO:	Hm003.07	WELL(S): N	16-31,30,18,2,5,7,8,10
	Ormet / Hannibal Ohio	DATE:	5-8 -97
SAMPLING PERSONNEL	J Campbell C Standard	TIME:	
COMPLETED BY:	JCampbell	•	

ITEMS	OK	NA	NOTES
PRIOR TO SAMPLING			
Health & safety plan; reviewed; equipment ready.	V		
Sample containers, coolers, received from laboratory (ica or ice			
pack and coolers ready.	V		
Sampling equipment and supplies inventoried, clean and		1	
operational.			
On - site client contact notified.	~		
Condition of well noted.	~		
Weil area prepared for sampling; plastic placed around well;			1
gasoline - powered pumps placed downwind.	V		İ
Water - level measurements made and recorded on			
Water Sampling Log with other pertinent field information.			
Field instruments calibrated; calibration recorded in field logbook	<u></u>		19H 4.0, 7.0+10.0 15DL 700+3400 MM hos /cm
Sample containers labelled; preservatives added, if necessary.	1		By Lah
DURING AND AFTER SAMPLING:			3x if 10% stabilization of pH+SpC
Three to five well volumes purged.	V		sx max; if dryes sample upon recovery
Sample collected using a bailer or pump as per sampling plan.	1		disposable bailer
Measurement of field parameters recorded on Water Sampling			
Log and in field log book.	V]	
Sample containers filled according to collection protocol of	ر ر ا	-	
analyses.		<u> </u> -	
Field and trip blanks collected; replicates or split samples		1	mw-7 (Dup-a) mw-31 (Dup-3)
collected and recorded in field log book.			
Samples stored on ice in coolers.	1	<u> </u>	
Water Sampling Log and Chain-of-Custody Recorded completed	1	1	,
Reusable equipment decontaminated; non-reusable equipment	ا ا	_	
disposed of in appropriate manner.			
Well secured and locked.	1		

Additional Comments: Kenvon Lub Courier picked up Samples, PLE sampled in MW-30,31,18

Orginal to Field Project File; copy to Project Manager and to QA Officer.

MW - 2, 5 + DUP-3



PROJECT NO:	Hm003,07	WELL(S):	mw-1,11,28,16,295
LOCATION:	Ormet / Hannibal Ohio		
SAMPLING PERSONNEL	J Campbell C Standard	TIME:	
COMPLETED BY:	J Campbell		

ITEMS	ОК	NA	NOTES
PRIOR TO SAMPLING			
Health & safety plan; reviewed; equipment ready.	V	·	
Sample containers, coolers, received from laboratory ica or ice:	,		
pack and coolers ready.			
Sampling equipment and supplies inventoried, clean and			
operational.			
On - site client contact notified.	~		
Condition of well noted.	~		
Well area prepared for sampling; plastic placed around well;			
gasoline - powered pumps placed downwind.			
Water - level measurements made and recorded on			
Water Sampling Log with other pertinent field information.	1		
Field instruments calibrated; calibration recorded in field logbook			ph 4.0, 7.0+10.0 Spc 700+3900 pm hus /cm
Sample containers labelled; preservatives added, if necessary.	1		By Lah
DURING AND AFTER SAMPLING:			3x if 10% stabilization of pH+SpC
Three to five well volumes purged.	L		sx max; if dryes sample upon recovery
Sample collected using a bailer or pump as per sampling plan.	~		disposable bailer
Measurement of field parameters recorded on Water Sampling			
Log and in field log book.	V		
Sample containers filled according to collection protocol of	,		
analyses.			
Field and trip blanks collected; replicates or split samples			Field Blank
collected and recorded in field log book.		<u> </u>	
Samples stored on ice in coolers.			
Water Sampling Log and Chain-of-Custody Recorded completed	-	1	
Reusable equipment decontaminated; non-reusable equipment			
disposed of in appropriate manner.			
Weil secured and locked.	1		

Additional Comments: Kenvon Lab Courier picked up Samples

Orginal to Field Project File; copy to Project Manager and to QA Officer.

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Project Name: Oymet	Sample ID: MW-17
Project Number: HM003.07	Replicate ID:
Site Location: Hannibal Ohio	Time Sampling Began: 0718
Sampling Date: 5-6-97 Weather: Sunny , bro	Time Sampling Completed: 0905
FVA	CUATION DATA
Description of Measuring Point (MP) Top of Pu	·
MP Elevation	Diameter of Well Casing
Total Sounded Depth of Well Below MP (TD) 77.91	Gallons to be Purged (19,4) 20
Depth to Water Below MP (DTW) 37.50	(3 WCVs, 5 WCVs, etc.)
Water Column (WC) in Well [TD-DTW] 40, 41	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart 0.16	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF] 6,47	= Well Casing Volume (WCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
	PLING DATA AND D PARAMETERS
	Turbidity: Slightly Turbid
	1.5 14.5 14.5 13 7.67 7.67
	77 492 488
Sampling Method and Material(s): Dispose his ha	The site and the second
l l	r Description Preservative
	or HMI preserved by: Lab X or HMI
Dissolved Metals 500 ml	- Plastic HAND - field filtered
	Plastic HNO3 - field filtered Plastic NAOH
Cyanide (Total + Amenable) 500 mi	Plastic NAOH
	Plastic NAOH
Cyanide (Total + Amenable) 500 mi	Plastic NAOH
Cyanide (Total + Amenable) 500 mi	Plastic NAOH
Cyanide (Total + Amenable) 500 mi pH, Sp Cond, Fluoride 250 mi	Plastic NAOH Plastic 4°C
Cyanide (Total + Amenable) 500 mm pH, Sp Cond, Fluoride 250 mm Sampling Personnel: J Campbell	Plastic NAOH
Cyanide (Total + Amenable) 500 mi pH, Sp Cond, Fluoride 250 mi	Plastic NAOH Plastic 4°C
Cyanide (Total + Amenable) 500 mm pH, Sp (and, Fluoride 250 mm) Sampling Personnel: J Campbell	Plastic NAOH Plastic 4°C



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Project Name: Ormet		Si	ample ID: MW-34d
Project Number: HM003.07		Re	eplicate ID:
Site Location: Hannibal Ohio		Ţi	me Sampling Began: 0920
	eather: Very wind		me Sampling Completed: 0958
			
	EVAC	JATION DATA	
			•
Description of Measuring Point (MP)	Top of PUC		
MP Elevation		Diameter of Well Casing	_2"
Total Sounded Depth of Well Below MP (TD)	68.24	Gallons to be Purged	(15.7) 16
Depth to Water Below MP (DTW)	35.67	(3 WCVs, 5 WCVs, etc.)	,
Water Column (WC) in Well (TD-DTW)	<i>32.57</i>		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16		1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	<u> 5.21 =</u>	Well Casing Volume (WCV	1 1 1 2 = 0.09 2 1 2 2 2 3 1 2 0.50 6 2 1.47
Evacuation Method and Material	Disposable bai	ler with poly n	ope
· ·	1		•
	SAMP	LING DATA AND	
	FIELD	PARAMETERS	
Color: Light Brown	Odor:		urbidity: Cloudy
Temperature:(°C)	14.5 14.5		7.45
pH: (5,0,)	7.27 7.39	7.43 7	7.43
Specific Conductance: (pmhcs/cm)	507 490	491 4	192
Sampling Method and Material(s):			×
·		Description	Preservative
Parameters to be Analyzed	From Lab	X or HMI	preserved by: Lab X or HMI
Dissolved Metals	500 mL	Plastic	HNO3 - field filtered
(yanide (Total + Amenable)	500 mL	Plastic	NAOH
pH, Spland, Fluoride	250 mL	Plastic	400
F . F			•
Sampling Personnel:	T ((4 1 1	
	J Campbell,	C Standard	
Comments:			
		· · · · · · · · · · · · · · · · · · ·	
			•



Page <u>3</u> of <u>31</u>

Project Name: Ormet	Sample ID: MW-345
Project Number: HM003.07	Replicate ID:
Site Location: Hannibal Ohio	Time Sampling Began: 0905
Sampling Date: 5-6-97 Weather: Very W	Time Sampling Completed: 0925
	EVACUATION DATA
Description of Measuring Point (MP) Top of	Puc
MP Elevation	Diameter of Well Casing
Total Sounded Depth of Well Below MP (TD) 49,35	Gallons to be Purged (6,1) 7
Depth to Water Below MP (DTW)36.72	(3 WCVs, 5 WCVs, etc.)
Water Column (WC) in Well [TD-DTW] 12. (,3	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart 0.16	1%"= 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF] 2.02	= Well Casing Volume (WCV) 11/4" = 0.09 21/4" = 0.26 31/4" = 0.50 6" = 1.47
	SAMPLING DATA AND FIELD PARAMETERS
•	·
Color: Brown Odor:	Turbidity: Turbid (SI Stained?)
Color: Brown Odor: Temperature: (°C) 14	Turbidity: Turbid (SI Stained?) 14 14 14
	2 3 find
Temperature: (°C)	14 14 14
Temperature: (°C) pH: (S.U.) Specific Conductance: (µmhcs/cm) Sampling Method and Material(s): Disposable Con	14 14 14 7.41 7.41 7.43 573 579 579
Temperature: (°C) pH: (S.U.) Specific Conductance: (µmhcs/cm) Sampling Method and Material(s): Disposable Com Parameters to be Analyzed From	14 14 19 7.41 7.41 7.43 573 579 579 Mailer with poly Rope Mainer Description Preservative
Temperature: (°C) 14 pH: (5.0,) 7.37 Specific Conductance: (pmhcs/cm) 563 Sampling Method and Material(s): Disposable Com Parameters to be Analyzed From Dissolved Metals 500	14 14 19 7.41 7.41 7.43 573 579 579 Mailer with poly Rope Italiner Description Preservative Ital X or HMI
Temperature: (°C) pH: (S.U.) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Disposable Com Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) 500	14 14 14 7.41 7.41 7.43 573 579 579 Mailer with poly Rope Mailer
Temperature: (°C) pH: (S.U.) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Disposable Com Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) 500	14 14 14 7.41 7.41 7.43 573 579 579 hailer with poly Rope tainer Description Preservative plab X or HMI preserved by: Lab X or HMI DML Plastic HAW3 - field filtered DML Plastic NAOH
Temperature: (°C) pH: (S.U.) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Disposable Com Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) 500	14 14 14 7.41 7.41 7.43 573 579 579 Mailer with poly Rope Italian Description Preservative In Lab X or HMI preserved by: Lab X or HMI DIML Plastic HAW3 - field filtered DIML Plastic NAOH DIML Plastic 4°C
Temperature: (°C) pH: (S.U.) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Disposable Com Parameters to be Analyzed Pissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride Sampling Personnel: J Campbel	14 14 14 7.41 7.41 7.43 573 579 579 Mailer with poly Rope Italian Description Preservative In Lab X or HMI preserved by: Lab X or HMI DIML Plastic HAW3 - field filtered DIML Plastic NAOH DIML Plastic 4°C



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Project Name: Ormet			Sample ID:	<u> Μω-15</u>
Project Number: HM003.07			Replicate ID:	MW-DUP-1
Site Location: Hannibal Ohio		·	Time Sampling	Began: 0935
Sampling Date: <u>5-6-97</u> Wes	ather: Windy.	50°	Time Sampling	Completed: 1016
Description of Measuring Point (MP) MP Elevation Total Sounded Depth of Well Below MP (TD) Depth to Water Below MP (DTW) Water Column (WC) in Well (TD-DTW) Gallons per foot (GPF); from chart Gallons in Well [WC x GPF]	Top of Puc 57.86 37.75 20.11 0.16 3.21	Diameter of Well Ca Gallons to be Pu (3 WCVs, 5 WCVs,	etc.) 1 1 2 - 0.06 (WCV) 1 1 2 - 0.09	GALLONS PER FOOT (gpf) 2" = 0.16 3" = 0.37 4" = 0.65 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method and Material	Disposable ba	iler with pe	ply rope	
		PLING DATA AND D PARAMETERS		
Color: Dark brown-black	Odor:		Turbidity: 5	itained
Temperature:(°C)	14.5	3 5 15	Final 15	
pH: (S.U,)	7.37 7.	39 7.41	7.44	
Specific Conductance: (ymhos/cm)	768 7.	<u> 726</u>	731	
Sampling Method and Material(s):_	Containe	r Description	1	Preservative
Parameters to be Analyzed		X or HMI		served by: Lab X or HMI
Dissolved Metals		- Plastic		03 - field filtered
Cyanide (Total + Amenable)	500 ml		NAO	<u>#</u>
pH, Spland, Fluoride	<u>250 mi</u>	Plastic	<u>4°C</u>	•
Sampling Personnel: Comments:	J Campbell	, (Standa	rd st	
•				



Page <u>5</u> of <u>36</u>

Project Name: Ormet		Sample ID: MW-36
Project Number: HM003.07	1	Replicate ID:
Site Location: Hannibal Ohio		Time Sampling Began: 1040
Sampling Date: 5-6-97 Weather: Wine	dy 40's :	Time Sampling Completed: 1/12
<u></u>	EVACUATION DATA	
Description of Measuring Point (MP) Top of	Puc	·
MP Elevation	Diameter of Well Casing	_2"
Total Sounded Depth of Well Below MP (TD) 52.08	Gallons to be Purged	(7.5) 7.5
Depth to Water Below MP (DTW) 36,52	(3 WCVs, 5 WCVs, etc.)	
Water Column (WC) in Well [TD-DTW] 15.56		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart 0.16	·· ·	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPFl 3.5	= Well Casing Volume (WC	V) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Color: Black - dark brown Odor: Temperature: (°C) 16 pH: (S.U.) 961 Specific Conductance: (µmhos/cm) 3350	15.5 15.5 9.63 9.65	Turbidity: Very stained and cloudy final 15.5 9.64 3290
Sampling Method and Material(s): Dispose ble	1 (ope .
Co	entainer Description	Preservative
Sometime to be Applicated Section 5	m tab. V as Utat	*******
	m Lab X or HMI	preserved by: Lab X or HMI
Dissolved Metals 50	omL Plastic	preserved by: Lab X or HMI
Dissolved Metals 50 Cyanide (Total + Amenable) 50	OML Plastic	preserved by: Lab X or HMI HANO3 ~ field filtered NAOH
Dissolved Metals 50 Cyanide (Total + Amenable) 50	omL Plastic	preserved by: Lab X or HMI
Dissolved Metals 50 Cyanide (Total + Amenable) 50	OML Plastic	preserved by: Lab X or HMI HANO3 ~ field filtered NAOH
Dissolved Metals 50 Cyanide (Total + Amenable) 50	00 mL Plastic 00 mL Plastic 50 ml Plastic	preserved by: Lab X or HMI HANO3 ~ field filtered NAOH
Dissolved Metals 50 Cyanide (Total + Amenable) 50 pH, Spland, Fluoride 25 Sampling Personnel: J Campbe	00 mL Plastic 00 mL Plastic 50 ml Plastic	preserved by: Lab X or HMI HNO3 ~ field filtered NAOH



Page <u>6</u> of ____

Project Name: Ormet		San	ple ID: Mω-32
Project Number: HM003.07		Rep	licate ID:
Site Location: Hannibal Ohio		Tim	e Sampling Began: //30
Sampling Date: <u>5-7-97</u> Weath	ner: <u>Sunny</u> , windy s	Tim	e Sampling Completed: 1200
	EVACUATION	I DATA	
Description of Measuring Point (MP)	Top of Puc	, , , , , , , , , , , , , , , , , , ,	
MP Elevation	Diame	eter of Well Casing	
Total Sounded Depth of Well Below MP (TD)		ulions to be Purged	(8.1) 8.5
Depth to Water Below MP (DTW)		Vs, 5 WCVs, etc.)	<u> </u>
Water Column (WC) in Well [TD-DTW]	17.08		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16		11%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	2.73 = Well (Casing Volume (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method and Material	SAMPLING D	ATA AND	
Color: Brown	Odor:	Tur	bidity: Stained (not Cloudy)
Temperature:(°C)	15.5 15.5	3 final _15.515.5	
pH: (5.U,)	8.37 <i>8.55</i>	8.64 8.7	<u> </u>
Specific Conductance: (umhos/cm)	590 633	670 69	2
Sampling Method and Material(s):	Disposable bailer u		Preservative
Parameters to be Analyzed	From Lab X or	НМІ	preserved by: Lab X or HMI
Dissolved Metals	500 mL Pl		HNO3 - field filtered
		astic	NAOH
Cyanide (Total + Amenable)		lastic	4°C
pH, Spland, Fluoride	a so ML P	asne	-75
	-/ 111 -	65 1 1	
	1 1	Standard	
Comments:	plan does not a	completely tilte	v out
<u> </u>	· · · · · · · · · · · · · · · · · · ·		···
	·		



		_	Sample ID: MW-35
Project Number: HM003.07		······································	Replicate ID:
lite Location: Hannibal Ohio		· <u>·</u>	Time Sampling Began: 1236
Sampling Date: <u>5-6-97</u> W	eather: <u>Sunny</u> , k	ireazy 50°	Time Sampling Completed: 1310
	EV	ACUATION DATA	
Description of Measuring Point (MP)	Top of Pu	JC	
MP Elevation	· •	Diameter of Well Casin	ng <i>2"</i>
otal Sounded Depth of Well Below MP (TD)	46.70	Gailons to be Purge	ed <u>(5) 7</u>
Depth to Water Below MP (DTW)	36.37	(3 WCVs, 5 WCVs, etc	:.)
Water Column (WC) in Well [TD-DTW]	10.33	_	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16	_	11/4" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	1.65	= Well Casing Volume (W	VCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Color: Brown	Odor:	ELD PARAMETERS	Turbidity: Stained and Cloudy
Temperature:(ºС)	15.5 15.	_	15.5 15.5
pH: (5.0,)	8.91 9.0	9 9.19	<i>9.30 9.47</i>
- 			
Specific Conductance: (pmhcs/cm)	506 63		770 900
Sampling Method and Material(s): Parameters to be Analyzed	Disposable b Contain	ner Description ab _X or HMI	Preservative preserved by: Lab X or HMI
Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals	Disposable b Contain From La	ner Description ab X or HMI	Rope Preservative preserved by: Lab X or HMI HNOz ~ field filtered
Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals (yanide (Total & Amenable)	Disposable 10 Contain From Li 500 m	ner Description ab X or HMI NC Plastic	Preservative preserved by: Lab X or HMI HNO3 ~ field filtered NAOH
Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals	Disposable b Contain From La	ner Description ab X or HMI NL Plastic	Preservative preserved by: Lab X or HMI HNOz ~ field filtered
Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals (yanide (Total & Amenable)	Disposable 10 Contain From Li 500 m	ner Description ab X or HMI NC Plastic	Preservative preserved by: Lab X or HMI HNO3 ~ field filtered NAOH
Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable)	Disposable 10 Contain From Li 500 m 250 m	ailer with polyner Description ab X or HMI AL Plastic AL Plastic ML Plastic	Preservative preserved by: Lab X or HMI HNOz ~ field filtered NAOH 4°C
Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals (yanide (Total & Amenable) pH, Spland, Fluoride	Disposable h Contain From Li 500 m 250 m T Campbell Color does m	ailer with polyner Description ab X or HMI AL Plastic AL Plastic ML Plastic	Preservative preserved by: Lab X or HMI HNO3 ~ field filtered NAOH 4°C



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Project Name: Ormet		-	ģ	Sample ID: M(J-37
Project Number: HM003.07		_	1	Replicate ID:
Site Location: Hannibal Ohio		_		Time Sampling Began: 1320
Sampling Date: <u>5-6-97</u> Wes	ather: <u>Cloudy</u> W	lindy 50) *	Time Sampling Completed: 134%
		ACUATION D)ATA	
Description of Measuring Point (MP)	Top of Pu	<u>IC</u>		-
MP Elevation _		_ Diamete	r of Well Casing	_2"
Total Sounded Depth of Well Below MP (TD) _	36.98	Gallo	ns to be Purged	(8.5) 9
Depth to Water Below MP (DTW)	19.40	_ (3 WCVs	s, 5 WCVs, etc.)	
Water Column (WC) in Well [TD-DTW]	17.58	-		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16			1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	2.81	_= Well Cas	sing Volume (WC	V) 1½" = 0.09 2½" = 0.26 3½" = 0.50 6" = 1.47
Evacuation Method and Material	SAM	MPLING DAT	'A AND	тре
Color: Dark brown	Odor:			Turbidity: Stained and Turbid
Temperature:(°C)	14.5	14.5	14.5	14.5
pH: (5.U,)	9.09	7.09	9.08	9.07
Specific Conductance: (µmhos/cm)	843 8	867	850	946
Sampling Method and Material(s):	Contain	ner Descriptio	en L	Preservative
Parameters to be Analyzed		b X or HN		preserved by: Lab X or HMI
Dissolved Metals	500 m	il Plas		HNO3 - field filtered
Cyanide (Total + Amenable)	500 m	L Plas	tic	NAOH
pH, Spland, Fluoride	<u>250 m</u>	11 Pla	stic	<u> 4°C</u>
				-
Sampling Personnel:	J Campbell		Standard	
Comments:	1			
'	Color does	not t	uter ou	
<u> </u>	Color does	_not_+	ilter out	



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Project Name: Ormet		Sample ID: Mu)-41
Project Number: HM003.07		Replicate ID:
Site Location: Hannibal Ohio		Time Sampling Began: 14/0
Sampling Date: 5-6-97 Weather: Cloudy	windy 50	Time Sampling Completed: 1500
	EVACUATION DATA	
	_	•
Description of Measuring Point (MP)	Puc	
MP Elevation	Diameter of Well Casing	_2"
Total Sounded Depth of Well Below MP (TD) 62.36		(23.5) 24
Depth to Water Below MP (DTW) 13.50		
Water Column (WC) in Well [TD-DTW] 48, 76		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart 0.16		11/4" = 0.06 2" = 0.18 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF] 7,8	= Well Casing Volume (WC	CV) 1½" = 0.09 2½" = 0.28 3½" = 0.50 6" = 1.47
	, ·, ·,	
Evacuation Method and Material <u>Disposable</u>	bailer with poly	whe
F		1
	SAMPLING DATA AND	
<u> </u>	FIELD PARAMETERS	1
Color: Brown Odor:		Turbidity: V Cloudy
Temperature: (°C)	15 15	final
pH: (5.0,) 6.89	6.99 6.96	6.98
Specific Conductance: (Lumbos /cm) 352	343 347	3.57
	·	
Sampling Method and Material(s): Dispose ble	1 1	ope .
	stainer Description	Preservative
	n Lab X or HMI	preserved by: Lab X or HMI
	omL Plastic	HAND3 - field filtered
Cyanide (Total + Amenable) 500	omL Plastic	NAOH
pH, Spland, Fluoride as	oml Plastic	<u>4°C</u>
1		
	· · · · · · · · · · · · · · · · · · ·	
Sampling Personnel: J Campbe	11, (Standard	
Sampling Personnel: J Camphe Comments:	11 , (Standard	
	11, (Standard	



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Site Location: Hannibal Ohio Time Sampling Began: 0745	Project Name: Ormet		Sample ID: MW-39d
EVACUATION DATA	Project Number: HM003.07		Replicate ID:
Description of Measuring Point (MP) Depth of Well Below MP (TD) Depth to Water Below MP (TD) Gallons per foot (GPP); from chart O. 16 SAMPLING DATA AND FELD PARAMETERS Color: Light Tau Odor: Turbidity: 51/ykhy Cloudy Temperatures: (*2.) DH: (S.U.) Specific Conductances: (ymbos 1cm) Sampling Method and Materialist: Disposable bailer with poly repe Container Description Parameters to be Analyzed Parameters to be Analyzed Parameters to be Analyzed Dispolued Methol Sampling Personnel: J Campbell , (Standard Sampling Personnel: J Campbell , (Standard	Site Location: Hannibal Ohio		Time Sampling Began: 0745
Description of Measuring Point (MP) MP Elevation MP Elevation Diameter of Well Casing (7) /9 Depth to Well Below MP (DTM) Depth to Well Below MP (DTM) Water Column (WC) in Well ITO-OTM Gallons per foot (GPF); from chart O.16 Evacuation Method and Material Disposable hailer with poly rope SAMPLING DATA AND FIELD PARAMETERS Color: Light Tax Odor: Turbidity: Slightly Closely Temperature: (°C) JS JS JS JS PH: (S.U.) Specific Conductance: (prehos low) Parameters to be Analyzed Physical Clotal - Areenable) Sampling Personnet: J Campbell , C Standard Sampling Personnet: J Campbell , C Standard Sampling Personnet: J Campbell , C Standard	Sampling Date: <u>5-7-97</u> Weather:	Году 40°	Time Sampling Completed: 0830
Description of Measuring Point (MP) MP Elevation MP Elevation Diameter of Well Casing (7) /9 Depth to Well Below MP (DTM) Depth to Well Below MP (DTM) Water Column (WC) in Well ITO-OTM Gallons per foot (GPF); from chart O.16 Evacuation Method and Material Disposable hailer with poly rope SAMPLING DATA AND FIELD PARAMETERS Color: Light Tax Odor: Turbidity: Slightly Closely Temperature: (°C) JS JS JS JS PH: (S.U.) Specific Conductance: (prehos low) Parameters to be Analyzed Physical Clotal - Areenable) Sampling Personnet: J Campbell , C Standard Sampling Personnet: J Campbell , C Standard Sampling Personnet: J Campbell , C Standard			
Oral Sounded Depth of Well Below MP (TD) Depth to Water Below MP (DTW) Depth to Water Below MP (DTW) Water Column (WC) in Well (DTW) Gallons per foot (GPF); from chart O.lly Gallons per foot (GPF); from chart O.lly Evacuation Method and Material Disposable harler with poly rope SAMPLING DATA AND FIELD PARAMETERS Color: Light Tau Odor: Turbidity: Slightly Cloudy Temperature: (°C) DISPOSABLE Mailer with poly rope SAMPLING DATA AND FIELD PARAMETERS Color: Light Tau Odor: Turbidity: Slightly Cloudy Temperature: (°C) DISPOSABLE Mailer with poly rope SAMPLING DATA AND FIELD PARAMETERS Color: Light Tau Odor: Turbidity: Slightly Cloudy Temperature: (°C) DISPOSABLE Mailer with poly Rope Container Description Preservative Parameters to be Analyzed From Lab X or HMI Dissolved Metals Cyunide (Total - Amenable) DISPOSABLE Mailer With Adoth HADQ - Sichl filtered Vanide (Total - Amenable) Sampling Personnel: Jample II (Standard		EVACUATION DATA	
Oral Sounded Depth of Well Below MP (TD) Depth to Water Below MP (DTW) Depth to Water Below MP (DTW) Water Column (WC) in Well (DTW) Gallons per foot (GPF); from chart O.lly Gallons per foot (GPF); from chart O.lly Evacuation Method and Material Disposable harler with poly rope SAMPLING DATA AND FIELD PARAMETERS Color: Light Tau Odor: Turbidity: Slightly Cloudy Temperature: (°C) DISPOSABLE Mailer with poly rope SAMPLING DATA AND FIELD PARAMETERS Color: Light Tau Odor: Turbidity: Slightly Cloudy Temperature: (°C) DISPOSABLE Mailer with poly rope SAMPLING DATA AND FIELD PARAMETERS Color: Light Tau Odor: Turbidity: Slightly Cloudy Temperature: (°C) DISPOSABLE Mailer with poly Rope Container Description Preservative Parameters to be Analyzed From Lab X or HMI Dissolved Metals Cyunide (Total - Amenable) DISPOSABLE Mailer With Adoth HADQ - Sichl filtered Vanide (Total - Amenable) Sampling Personnel: Jample II (Standard		(n	
Color: Light Tau Odor: Turbidity: Slightly Cloudy Temperature: (°C) 15 15 15 15 15 15 15 15 15 15 15 15 15	•		
Depth to Water Below MP (DTW) 40.82 (3 WCVs, 5 WCVs, stc.) Water Column (WC) in Well (TD-DTW) 39.39 (GALLONS PER FOOT (gpf)) Gallons per foot (GPF): from chart 0.16 (GALLONS PER FOOT (gpf)) Gallons in Well (WC x GPF) (G.3) = Well Casing Volume (WCV) Evacuation Method and Material Disposable hailer with poly rope SAMPLING DATA AND HELD PARAMETERS Color: Light Tam Odor: Turbidity: Slightly Cloudy Temperature: (C) 15 15 15 15 PH: (S.U.) 2.55 2.64 7.67 7.66 Specific Conductance: (punhos lcm) 445 454 455 457 Sampling Method and Materialisi: Disposable hailer with poly loge Container Description Preservative Preservative Prom Lab X or HMI preserved by: Lab X or HMI Dissolved Metals 500 ML Plastic HAO3 - field filtered Cyanide (Total + Amenable) 500 ML Plastic NAOH Sampling Personnel: Tampbell , Standard Sampling Personnel: Tampbell , Standard			(ic) 10
Sampling Method and Materialisi: Disposchie Meiler with poly rope SAMPLING DATA AND HELD PARAMETERS Color: Light Tan Odor: Turbidity: Slightly Cloudy Temperature: (°C) 15 15 15 15 15 15 15 15 15 15 15 15 15		· ·	<u>U77 /1</u>
Gallons per foot (GPF); from chart Gallons in Well (WC x GPF) Gallons in Well (WC x GPF) Evacuation Method and Material Disposable hailer with poly rope SAMPLING DATA AND FIELD PARAMETERS Color: Light Tan Odor: Turbidity: 5lightly Cloudy Temperature: (°C) PH: (S.U.) Specific Conductance: (µmhos lcm) Sampling Method and Material(s): Disposable hailer with poly rope SAMPLING DATA AND FIELD PARAMETERS Turbidity: 5lightly Cloudy Temperature: (°C.) PH: (S.U.) Specific Conductance: (µmhos lcm) Form Lab Y 455 Sampling Method and Material(s): Disposable hailer with poly Rope Container Description Preservative		GALLONS PER FOOT (and)	
Color: Light Tan Odor: Turbidity: 51ightly Cloudy Temperature: (PC) 15 15 15 15 15 15 15 15 15 15 15 15 15			
Evacuation Method and Material Disposable hailer with poly rope SAMPLING DATA AND FIELD PARAMETERS Color: Light Tan Odor: Turbidity: Slightly Cloudy Temperature: (°C) 15 15 15 15 pH: (SU) 7.55 7.64 7.67 7.66 Specific Conductance: (1,mhcs/cm) 445 457 457 Sampling Method and Material(s): Disposable hailer with poly Rox Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X or HMI Dissolved Metals Soom Plastic HAO3 - field filtered Cyanide (Total - Amenable) Soom Plastic WAOH Sampling Personnel: J Campbell , (Standard)	·		
SAMPLING DATA AND FIELD PARAMETERS Color: Light Tam Odor: Turbidity: Slightly Cloudy Temperature: (°C) 15 15 15 15 PH: (S.U.) 7.55 7.64 7.67 7.66 Specific Conductance: (punhos lcm) 445 455 457 Sampling Method and Material(s): Disposable Pailer with poly Rope Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X or HMI Dissolved Metals 500 ML Plastic HAD3 - field filtered Cyanide (Total - Amenable) 500 ML Plastic NAOH PH. Sp(and, Fluoride 250 ML Plastic 4°C Sampling Personnel: T Campbell (Standard)			
SAMPLING DATA AND FIELD PARAMETERS Color: Light Tam Odor: Turbidity: Slightly Cloudy Temperature: (°C) 15 15 15 15 PH: (S.U.) 7.55 7.64 7.67 7.66 Specific Conductance: (punhos lcm) 445 455 457 Sampling Method and Material(s): Disposable Pailer with poly Rope Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X or HMI Dissolved Metals 500 ML Plastic HAD3 - field filtered Cyanide (Total - Amenable) 500 ML Plastic NAOH PH. Sp(and, Fluoride 250 ML Plastic 4°C Sampling Personnel: T Campbell (Standard)	Evacuation Method and Material	ble bailer with poly	രും
Color: Light Tan Odor: Turbidity: Slightly Cloudy Temperature: (°C) Disposable Mailer with poly Rox Container Description Preservative Parameters to be Analyzed Disposable Mailer with poly Rox Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X or HMI preserved by: Lab X or HMI preserved by: Lab X or HMI Analyzed Cyanide (Total + Amenable) Disposable Mailer with poly Rox Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X or HMI preserved by: Lab X or HMI Analyzed Cyanide (Total + Amenable) Soome Plastic MAOH PH. Spland, Fluoride Sampling Personnel: Tampbell Standard	· ·	·	•
Color: Light Tan Odor: Turbidity: Slightly Cloudy Temperature: (°C) 15 15 15 15 pH: (S.U.) 7.55 7.64 7.67 7.66 Specific Conductance: (µmhcs/cm) 445 455 457 Sampling Method and Material(s): Disposable hailer with poly Rose Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X or HMI preserved by: Lab X or HMI preserved by: Lab X or HMI ph. Splande (Total = Amenable) 500 mL Plastic HAD3 = field filtered Cyanide (Total = Amenable) 500 mL Plastic HAD4 Sampling Personnel: J Campbell (Standard)		SAMPLING DATA AND	
Temperature: (°C) pH: (S.U.) 7.55 7.64 Temperature: (°C) pH: (S.U.) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Disposable hailer with poly Rose Container Description Preservative Parameters to be Analyzed From Lab X or HMI Dissolved Metals Sooml Plastic Cyanide (Total + Amenable) pH, Spland, Fluoride Sampling Personnel: J Campbell (Standard) Sampling Personnel: J Campbell (Standard)		FIELD PARAMETERS	
Temperature: (°C) pH: (S.U.) 7.55 7.64 Temperature: (°C) pH: (S.U.) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Disposable hailer with poly Rose Container Description Preservative Parameters to be Analyzed From Lab X or HMI Dissolved Metals Sooml Plastic Cyanide (Total + Amenable) pH, Spland, Fluoride Sampling Personnel: J Campbell (Standard) Sampling Personnel: J Campbell (Standard)			
Specific Conductance: (pmhos/cm) 7.55 7.64 7.67 7.66 Specific Conductance: (pmhos/cm) 445 455 457 Sampling Method and Material(s): Disposable bailer with poly Rope Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab	55.6 75.6		
Sampling Method and Material(s): Disposable Mailer with poly Rose Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X or HMI preserved			
Sampling Method and Material(s): Disposable Mailer with poly Rope Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X or HMI preserved			
Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X	Specific Conductance: (ymhos /cm) 773	759 735 9	37
Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X			
Container Description Preservative Parameters to be Analyzed From Lab X or HMI preserved by: Lab X	Sampling Method and Material(s):	able hailer with poly Ro	oe
Dissolved Metals Cyanide (Total + Amenable) Dissolved Metals Some Plastic Whote Plastic Whote Plastic Whote Some Plastic Whote Some Plastic Whote Some Plastic Whote Whote Some Plastic Some Plastic Whote Some Plastic Some Plastic Whote Some Plastic Some Plasti		Container Description	Preservative
Cyanide (Total + Amenable) 500 mL Plastic NAOH pH, Sp(and, Fluoride 250 ml Plastic 4°C Sampling Personnel: J Campbell, (Standard	Parameters to be Analyzed	From Lab X or HMI	preserved by: Lab X or HMI
pH, Spland, Fluoride 250 ml Plastic 4°C Sampling Personnel: J Campbell, (Standard	Dissolved Metals	500 mL Plastic	HNO3 - field filtered
pH, Spland, Fluoride 250 ml Plastic 4°C Sampling Personnel: J Campbell, (Standard	(vanide (Total + Amenable)	500 ml Plastic	NAOH
Sampling Personnel: J Campbell, (Standard			
		The state of the s	
	Sampling Personnel	-hall (et 1 1	
Comments:		purit, Colandard	
	Comments:		

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		Sample ID: M() - 395
Project Number: HM003.07		Replicate ID:
Site Location: Hannibal Ohio		Time Sampling Began: 0840
Sampling Date: 5-7-97 Weather: Fagy	y <u>4</u> 0°	Time Sampling Completed: 09/5
	EVACUATION DATA]
		·
Description of Measuring Point (MP) Top of	Puc	<u> </u>
MP Elevation	Diameter of Well Casing	7
Total Sounded Depth of Well Below MP (TD) 60.23	Gallons to be Purger	i (10.2) 10.5
Depth to Water Below MP (DTW) 41,10	(3 WCVs, 5 WCVs, etc.	,
Water Column (WC) in Well (TD-DTW) <u>21.13</u>		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart 0.16	 _	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF] 3,4	= Well Casing Volume (W	CV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method and Material <u>Disposable</u>	bailer with poly	rope
,	. ' '	
	SAMPLING DATA AND	
	FIELD PARAMETERS	ا
_		
Color: Amber brown Odor:		Turbidity: Stained
Temperature: (°C)	15 15 1	<u> </u>
//	C. 0.1 - 0.2 C	-
		<u> </u>
		30 500
Specific Conductance: (µmhos/cm) 5760	5550 5770 5	500
Specific Conductance: (pmhos /cm) 5760 Sampling Method and Material(s): Dispose ble	5550 5770 5	
Specific Conductance: (pmhos/cm) .5760 Sampling Method and Material(s): Disposable Con	5550 5770 5 Mailer with poly 1	500 Cope :
Specific Conductance: (pmhcs/cm) 5760 Sampling Method and Material(s): Disposable Cor Parameters to be Analyzed From	5550 5770 5 bailer with poly I	Preservative
Specific Conductance: (pmhos/cm) 5760 Sampling Method and Material(s): Disposable Cor Parameters to be Analyzed From Dissolved Metals 500	SSSO S770 S bailer with poly Intainer Description The Lab X or HMI	Preservative preserved by: Lab X or HMI
Specific Conductance: (ymhos/cm) 5760 Sampling Method and Material(s): Dispose ble Cor Parameters to be Analyzed From Dissolved Metals 500 (yanida (Total + Amenable) 500	hailer with poly Intainer Description The Lab X or HMI OML Plastic OML Plastic	Preservative preserved by: Lab X or HMI HNO3 ~ Sield filtered
Specific Conductance: (pmhos/cm) 5760 Sampling Method and Material(s): Dispose ble Con Parameters to be Analyzed From Dissolved Metals 500 (yanida (Total + Amenable) 500	hailer with poly Intainer Description The Lab X or HMI OML Plastic	Preservative preserved by: Lab X_ or HMI HN03 ~ field filtered NAOH
Specific Conductance: (pmhos/cm) 5760 Sampling Method and Material(s): Dispose ble Cor Parameters to be Analyzed From Dissolved Metals 500 (yanide (Total + Amenable) 500	hailer with poly Intainer Description The Lab X or HMI OML Plastic OML Plastic	Preservative preserved by: Lab X_ or HMI HN03 ~ field filtered NAOH
Specific Conductance: (pmhos/cm) 5760 Sampling Method and Material(s): Dispose ble Cor Parameters to be Analyzed From Dissolved Metals 500 (yanide (Total + Amenable) 500	hailer with poly Intainer Description The Lab X or HMI OML Plastic OML Plastic	Preservative preserved by: Lab X_ or HMI HN03 ~ field filtered NAOH
Specific Conductance: (ymhos/cm) 5760 Sampling Method and Material(s): Disposable Cor Parameters to be Analyzed From Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride 250	bailer with poly Intainer Description The Lab X or HMI OML Plastic OML Plastic OML Plastic	Preservative preserved by: Lab X_ or HMI HN03 ~ field filtered NAOH
Specific Conductance: (ymhos/cm) 5760 Sampling Method and Material(s): Disposable Cor Parameters to be Analyzed From Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride Sampling Personnel: J Campbe	bailer with poly Intainer Description The Lab X or HMI OML Plastic OML Plastic OML Plastic	Preservative preserved by: Lab X_ or HMI HN03 ~ field filtered NAOH
Specific Conductance: (ymhos/cm) 5760 Sampling Method and Material(s): Disposable Cor Parameters to be Analyzed From Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride Sampling Personnel: J Campbe	bailer with poly Intainer Description The Lab X or HMI OML Plastic OML Plastic OML Plastic	Preservative preserved by: Lab X_ or HMI HN03 ~ field filtered NAOH

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Project Name: Ormet			Sample ID: M	W-12
Project Number: HM003.07			Replicate ID:	
Site Location: Hannibal Ohio			Time Sampling Bega	n: 0930
Sampling Date: <u>5-7-97</u> We	ather: Sunny 40	<u>)'s</u>	Time Sampling Com	oleted: /0.5
	EVAC	CUATION DATA		
Description of Measuring Point (MP)	Top of Puc			
MP Elevation	10p 0: 10C	Diameter of Well C	asing 2"	
otal Sounded Depth of Well Below MP (TD)	68.24	Gailons to be P		
Depth to Water Below MP (DTW)	23.30	(3 WCVs, 5 WCVs		
Water Column (WC) in Well [TD-DTW]	44.94			ONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16		1%" = 0.08 2"	= 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	7.2	= Well Casing Volum	e (WCV) 1%" = 0.09 2%"	= 0.26 3%" = 0.50 6" = 1.4"
Evacuation Method and Material	Disposable has	iler with a	olu rope	
	DISPOSANTE DA	Her Will P	ory rope	
	SAMI	PLING DATA AND		
	İ	D PARAMETERS		
				
Calar: None	Odor:		Turbidity: Clear	
Temperature:(°C)	15.5 15.5	15.5	15.5	
oh: (S.U,)	7.57 7.66	7.71	7,70	
Specific Conductance: (µmhos/cm)	4a8 4a2	421	<u> 422 </u>	
	·			
Sampling Method and Material(s):	Disposable hai	ler with poli	Rox	
•	4	r Description		Preservative
Parameters to be Analyzed	From Lab	or HMI	preserved	by: Lab X or HMI
Dissolved Metals	500 ml	- Plastic		field filtered
(vanide (Total + Amenable)	500 ml	Plastic	NAOH	
pH. Soland, Fluoride	250 mi		4°C	
7 - 7				• .
				
				
Sampling Personnel:	J Campbell	. C Standa	rd	
Comments:		1		
				·



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Project Name: OrweT		<u>_</u>	Sample ID: MW-42d
Project Number: HM003.07		_	Replicate ID:
Site Location: Hannibal Ohio			Time Sampling Began: 1045
Sampling Date: 5-7-97 We	ather: Sunny 5	0's	Time Sampling Completed: //38
	EVA	ACUATION DATA	
Description of Measuring Point (MP)	Top of Pu	ic	<u> </u>
MP Elevation _	<u> </u>	_ Diameter of Well (Casing
Total Sounded Depth of Well Below MP (TD)	85.10	Gallons to be F	Purged (<u>(21.7)</u> <u>22</u>
Depth to Water Below MP (DTW)	39.93	(3 WCVs, 5 WCVs	s, etc.)
Water Column (WC) in Well [TD-DTW]	<i>45.17</i>	_	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16	_	114" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	7. 23	_= Well Casing Volun	ne (WCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method and Material	SAN	MPLING DATA AND	poly rope
Color: None	Odor:		Turbidity: Clear
Temperature: (°C)	1	5 15	Turbidity: (lear 15
	15 1	•	final
Temperature:(°C)	15 1 7.83 7	5 15	15
Temperature:(oC) pH: (ムリ,)	15 / 7.83 7 473 9 Dispose ble he	5 15 .89 8.00 168 466 ailer with pol	7.5° 7.99 468 y Rope
Temperature: (°C) pH: (5.0,) Specific Conductance: (µmhos /cm) Sampling Method and Material(s):	1.5 1 7.83 7 47.3 4 Dispose ble he Contain	15 15 8.00 168 466 466 466 466 466 466 466 466 466 4	15" 7.99 468 Y Rope Preservative
Temperature: (°C) pH: (5.0,) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Parameters to be Analyzed	1.5 / 7.83 7. 47.3 4 Dispose ble he Contain	15 15 8.00 168 466 466 466 466 466 466 466 466 466 4	7.59 468 Y Rope Preservative preserved by: Lab X or HMI
Temperature: (°C) pH: (5.0,) Specific Conductance: (ymhos /cm) Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals	1.5 1.7.83 7.47.3 4.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2	15 189 8.00 168 466 ailer with policer Description b X or HMI L Plastic	7.99 468 Preservative preserved by: Lab X or HMI HAW3 - field filtered
Temperature: (°C) pH: (S.U.) Specific Conductance: (pmhos lcm) Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals (yanide (Total + Amenable)	1.5 7.83 7.473 4 Dispose ble he Contain From La 500 m	15 15 189 8.00 168 466 Ailer with policier Description b X or HMI Plastic Plastic	7.99 468 Preservative preserved by: Lab X or HMI HAW3 - field filtered NAOH
Temperature: (°C) pH: (5.0,) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals	1.5 1.7.83 7.47.3 4.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2	15 15 189 8.00 168 466 Ailer with policer Description b X or HMI L Plastic L Plastic	7.99 468 Preservative preserved by: Lab X or HMI HAW3 - field filtered
Temperature: (°C) pH: (S.U.) Specific Conductance: (pmhos lcm) Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals (yanide (Total + Amenable)	1.5 7.83 7.473 4 Dispose ble he Contain From La 500 m	15 15 189 8.00 168 466 Ailer with policier Description b X or HMI Plastic Plastic	7.99 468 Preservative preserved by: Lab X or HMI HAW3 - field filtered NAOH
Temperature: (°C) pH: (S.U.) Specific Conductance: (ymhos /cm) Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride Sampling Personnel:	1.5 7.83 7.473 4 Dispose ble he Contain From La 500 m	15 15 189 8.00 168 466 Ailer with policier Description b X or HMI Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 - field filtered NAOH 492
Temperature: (°C) pH: (S.U.) Specific Conductance: (pmhos.lcm) Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride	1.5 7.83 7.473 4 Dispose ble be Contain From La 500 m	15 15 187 8.00 168 466 Aller with political plastic Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 - field filtered NAOH 492



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Project Name: Ormet			Sample ID:	MW-425
Project Number: HM003.07			Replicate ID:	
Site Location: Hannibal Ohio			Time Sampline	g Began: // / A
Sampling Date: <u>5-7-97</u> We	eather: <u>Sunny</u> la	0	Time Sampling	g Completed: 1205
	EVAC	CUATION DATA		
Description of Measuring Point (MP)	Top of Puc	·		·
MP Elevation _	·	Diameter of Well (Casing	
Total Sounded Depth of Well Below MP (TD) _	<i>5</i> a.30	Gallons to be F	rurged <u>(5.9)</u> (·
Depth to Water Below MP (DTW)	40.04	(3 WCVs, 5 WCVs	, etc.)	· · · · · · · · · · · · · · · · · · ·
Water Column (WC) in Well [TD-DTW]	12.26			GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart_	0.16	•	1 % = 0.06	-
Gallons in Well [WC x GPF]	1.96	= Well Casing Volun	ne (WCV) 1%" = 0.09	2½" = 0.26 3½" = 0.50 6" = 1.47
Color: Light Tan Temperature: (°C)	l l	PLING DATA AND D PARAMETERS 3 1.5	Turbidity:	Slightly Cloudy
pH: (5.U,)	8.40 8.5	ે <u>૨ ૪.5</u> ૨	8.57	
Specific Conductance: (mhos/cm)	1190 132	5 1340	1350	
Sampling Method and Material(s):		ler with pol	y Rope	Preservative
Parameters to be Analyzed	From Lab	or HMI	•	served by: Lab X or HMI
Dissolved Metals	500 ml	- Plastic		03 - field filtered
(yanide (Total + Amenable)	500 ml	Plastic	NAO	H
pH, Spland, Fluoride	250 mi	Plastic	<u>4°C</u>	
				•
		· · · · · · · · · · · · · · · · · · ·		·
Sampling Personnel:	J Campbell	, C Standa	ird	
Comments:				
	<u> </u>			
· ·			•	·



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		Sample ID: MU-19
Project Number: HM003.07		Replicate ID:
Site Location: Hannibal Ohio		Time Sampling Began: 1245
Sampling Date: <u>5-7-97</u> Weather: <u>Sampling Date</u> : <u>Sampli</u>	enny 60°	Time Sampling Completed: 1325
	EVACUATION DATA PUC Diameter of Work Gallons to to 150 (3 WCVs, 5 WCVs)	pe Purged (//, 4) 12
Water Column (WC) in Well [TD-DTW] 23	.70	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart0	.16	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]3	= Well Casing Vo	dume (WCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method and Material Dispos	SAMPLING DATA AND	
Calor: Brown Odor:		Turbidity: Cloudy
	2 3	final /
Temperature:(°C)	13.5 13.5	13.5
Temperature: (°C) /3.5 pH: (5.0,) 7.40		
	13.5 13.5	2 7.50
pH: (5.U,) 7.40	13.5 13.5 7.49 7.5 437 43.	2 7.50 3 431
pH: (S.U.) 7.40 Specific Conductance: (µmhcs/cm) 443 Sampling Method and Material(s): Dispos Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable)	13.5 13.5 7.49 7.5 437 43. So hie hailer with a Container Description From Lab X or HMI 500 ml Plastic 500 ml Plastic	2 7.50 3 431 Doly Rope Preservative preserved by: Lab X or HMI HAW3 - Field filtered NAOH
Specific Conductance: (pmhcs/cm) 7.40 Specific Conductance: (pmhcs/cm) 443 Sampling Method and Material(s): Dispose Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride Sampling Personnel: J Can	13.5 7.49 7.5 437 437 438 Soble hailer with a Container Description From Lab X or HMI 500 mL Plastic 500 mL Plastic 250 ml Plastic	2 7.50 3 431 Preservative preserved by: Lab X_ or HMI HAW3 - field filtered NAOH 4°C
Specific Conductance: (µmhos/cm) 7.40 Specific Conductance: (µmhos/cm) 443 Sampling Method and Material(s): Dispose Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride	13.5 7.49 7.5 437 437 438 Soble hailer with a Container Description From Lab X or HMI 500 mL Plastic 500 mL Plastic 250 ml Plastic	2 7.50 3 431 Preservative preserved by: Lab X_ or HMI HAW3 - field filtered NAOH 4°C



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			Sample ID: MW-40d
Project Number: HM003.07			Replicate ID:
Site Location: Hannibal Ohio			Time Sampling Began: 1345
Sampling Date: <u>5-7-97</u> We	eather: Sunny 6	00°	Time Sampling Completed: 1435
Description of Measuring Point (MP)	EVA	CUATION DATA]
MP Elevation	· · · · · · · · · · · · · · · · · · ·	Diameter of Well Casing	. <u>_2"</u>
Total Sounded Depth of Well Below MP (TD)	90.40_	Gallons to be Purged	(18.6) 19
Depth to Water Below MP (DTW)	51.77	(3 WCVs, 5 WCVs, etc.))
Water Column (WC) in Well [TD-DTW]	38.63	-	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16	-	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.55
Gallons in Well [WC x GPF]	6.18	= Well Casing Volume (W	CV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method and Material	SAM	PLING DATA AND D PARAMETERS	
Color: None	Odor:		Turbidity: Clear
Temperature:(°C)		.5	<u> </u>
pH: (5.U,)	7.78 7.	86 7.85	7.90
	7.78 7. 1340 13		7.90 1350
Specific Conductance: (pmhcs/cm) Sampling Method and Material(s):	Disposable ha	iler with poly &	ارغ مرد . Preservative
Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Parameters to be Analyzed	Disposable has	iler with poly ker Description X or HMI	Preservative preserved by: Lab X or HMI
pH: (S.U,) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s):	Disposable has	ler with poly R The contract of the contract	ارغ مرد . Preservative
Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Parameters to be Analyzed	Disposable has Contained From Lab	iler with poly & properties X or HMI Plastic	Preservative preserved by: Lab X or HMI
Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals	Disposable has Contained From Lab	iler with poly R or Description X or HMI Plastic Plastic	Preservative preserved by: Lab X_ or HMI HNO3 ~ field filtered
Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals (yanide (Total + Amenable)	Dispose ble har Containe From Lab 500 mil	iler with poly R or Description X or HMI Plastic Plastic	Preservative preserved by: Lab X_ or HMI HNO3 ~ field filtered NAOH
Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals (yanide (Total + Amenable) pH, Splond, Fluoride Sampling Personnel:	Dispose ble har Containe From Lab 500 mil	iler with poly R or Description X or HMI Plastic Plastic	Preservative preserved by: Lab X_ or HMI HNO3 ~ field filtered NAOH
Specific Conductance: (pmhos/cm) Sampling Method and Material(s): Parameters to be Analyzed Dissolved Metals (yanide (Total + Amenable) pH, Spland, Fluoride	Disposable has Containe From Lab 500 ml 500 m	iler with poly k or Description X or HMI Plastic Plastic Plastic	Preservative preserved by: Lab X_ or HMI HNO3 ~ field filtered NAOH



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Project Name: Ormet		Samole iD: MU-405
Project Number: HM003.07		Replicate ID:
Site Location: Hannibal Ohio		Time Sampling Began: 1437
	ther:	Time Sampling Completed: 1504
	EVACUATION DATA	
·		•
Description of Measuring Point (MP)	Top of Puc	<u> </u>
MP Elevation	Diameter of Well Ca	asing <u>a"</u>
Total Sounded Depth of Well Below MP (TD)	70,40 Gallons to be Pu	ırged <u>(9,9) 9</u>
Depth to Water Below MP (DTW)	51.97 (3 WCVs, 5 WCVs,	etc.)
Water Column (WC) in Well [TD-DTW]	18.43	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16	1 1/2" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	2.95 = Well Casing Volume	e (WCV) 1½° = 0.09 2½° = 0.26 3½° = 0.50 6° = 1.47
Evacuation Method and Material	Disposable bailer with po	oly rope
;	· · · · · · · · · · · · · · · · · · ·	<i>'</i>
	SAMPLING DATA AND	
	FIELD PARAMETERS	
Color: Brown	Odor:	Turbidity: Cloudy
Temperature:(°C)	15.5 15.5 15.5	15.5
pH: (5.0,)	8.04 8.06 8.06	8.07
Specific Conductance: (umhos/cm)	1385 1400 1416	1417
Sampling Method and Material(s):	Disposable bailer with poly	- Rope
	Container Description	Preservative
Parameters to be Analyzed	From Lab X or HMI	preserved by: Lab X or HMI
Dissolved Metals	500 mL Plastic	HAND3 - field filtered
(yanide (Total + Amenable)	500 ml Plastic	NAOH
pH, Spland, Fluoride	250 ml Plastic	4°C
7		
		
		,
Sampling Personnel:	J Campbell, C Standar	rd
Comments:	• .	
		•
-		



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Project Name: OrmeT		S	Sample ID: MW-29d
Project Number: Hm003.07		I	Replicate ID:
Site Location: Hannibal Ohio		J	Time Sampling Began: 1515
Sampling Date: <u>5-7-97</u> We	eather: Sunny Lin	ly 60°	Time Sampling Completed: 1600
	EVACL	JATION DATA	
Description of Measuring Point (MP)	Top of Puc		
MP Elevation		Diameter of Well Casing	-2"
Total Sounded Depth of Well Below MP (TD)	81.98	Gallons to be Purged	(203) 205
Depth to Water Below MP (DTW)		(3 WCVs, 5 WCVs, etc.)	
Water Column (WC) in Well [TD-DTW]	<u> 42.28</u>		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16		1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.85
Gallons in Well [WC x GPF]	<u>6.76</u> =	Well Casing Volume (WC	V) 1½" = 0.09 2½" = 0.26 3½" = 0.50 6" = 1.47
Evacuation Method and Material	Disposable bail	er with poly	оре
	· · · · · · · · · · · · · · · · · · ·		
	SAMPL	ING DATA AND	
	FIELD	PARAMETERS	
Color: None	Odor:	3	Turbidity: Clear
Temperature:(°C)	15.5 15.5		<i>IS.5</i>
pH: (5.0,)	7.47 7.75		7.50
Specific Conductance: (pmhos/cm)	527 481	479	479
Sampling Method and Material(s):		•	
	Dispose he hade	or with only Ro	· ·
		er with poly Ro Description	Preservative
Parameters to be Analyzed	Container 1	Description (Preservative
Parameters to be Analyzed	Container !	Description X or HMI	Preservative preserved by: Lab X or HMI
Parameters to be Analyzed Dissolved Metals	Container From Lab	Description X or HMI Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered
Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable)		Description X or HMI Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Parameters to be Analyzed Dissolved Metals	Container From Lab	Description X or HMI Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered
Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable)		Description X or HMI Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable)		Description X or HMI Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) PH, Spland, Fluoride	Container From Lab _ 500 mL 250 mL	Description X or HMI Plastic Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) PH, Spland, Fluoride Sampling Personnel:		Description X or HMI Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) PH, Spland, Fluoride	Container From Lab _ 500 mL 250 mL	Description X or HMI Plastic Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride Sampling Personnel:	Container From Lab _ 500 mL 250 mL	Description X or HMI Plastic Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH



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Project Name: Ormet			Sample ID: Mu)-31
Project Number: HM003.07			Replicate ID: MW-Dup - 3
Site Location: Hannibal Ohio			Time Sampling Began: 0740
Sampling Date: 5-8-97 Weather	r: <u>50° L+</u>	Rain	Time Sampling Completed: 0845
·			
	FVAC	UATION DATA	
		<u> </u>	······································
Description of Measuring Point (MP)	op of PUC		
MP Elevation		Diameter of Well Cas	sing
Total Sounded Depth of Well Below MP (TD)	67,51	Gallons to be Purg	ged (9.9) /O
Depth to Water Below MP (DTW)	46.92	(3 WCVs, 5 WCVs, e	tc.)
Water Column (WC) in Well [TD-DTW]	20.59		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16		1%" = 0.08 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	3,30 =	Well Casing Volume	(WCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
	.,		
Evacuation Method and Material	iposable bai	ler with poli	y rope
<i>;</i>	CAMP	LINC DATA AND	
	1	LING DATA AND PARAMETERS	
	1.2.2	Allantino	·
Color: Dark brown-black oc	ior:		Turbidity: Very Stained
Temperature:(°C)	15	15	final 15
pH: (5.0,) 9.6	8 9.72	9.72	9,69
Specific Conductance: (pmhos/cm) 214	10 2200	2200	2100
			·
, , , , , , , , , , , , , , , , , , ,			0
Sampling Method and Material(s):	-1	er with poly. Description	Preservative
Parameters to be Analyzed	•	X or HMI	preserved by: Lab X_ or HMI
Dissolved Metals			HANDS - field filtered
	500 mL		
Cyanide (Total + Amenable)	500mL		NAOH
pH, Spland, Fluoride	250 mi	Plastic	4°C
·		Plastic	
pH, Spland, Fluoride	250 mi	Plastic	4°C
pH, Spland, Fluoride	250 mi	Plastic L 61ass	4°C HCL
pH, Spland, Fluoride	250 mi	Plastic	4°C HCL
PCE Sampling Personnel: J	250 mi	Plastic L 61ass (Standar	4°C HCL
pH, Splond, Fluoride PCE Sampling Personnel:	250 ml 2x40 ml Campbell	Plastic L 61ass (Standar	4°C HCL



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Project Name: Ormet	Sample ID: M(,)-18
Project Number: HM003.07	Replicate ID:
Site Location: Hannibal Ohio	Time Sampling Began: 0858
Sampling Date: 5-8-97 Weather: OvevC	45† 50° Time Sampling Completed: 0940
	EVACUATION DATA
	·
Description of Measuring Point (MP) Top of	Pur
MP Elevation	Diameter of Well Casing 2"
Total Sounded Depth of Well Below MP (TD) 58,00	Gallons to be Purged (8.7) 9
Depth to Water Below MP (DTW)39,89	
Water Column (WC) in Well [TD-DTW] 18,16	
Gallons per foot (GPF); from chart 0.16	
Gallons in Well [WC x GPF] 2.9	= Well Casing Volume (WCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method and Material <u>Disposable</u>	hailer with poly rope
, , , , , , , , , , , , , , , , , , ,	
	SAMPLING DATA AND
	FIELD PARAMETERS
Color: Dark brown-black Odor: Sli	ght wispy sheen Turbidity: Very stained and Cloudy
Temperature: (°C)	15 15 15
pH: (S.U.) 9.57	9.40 9.58 9.58
Specific Conductance: (µmhcs/cm) 4280	4270 4130 4110
Sampling Method and Materialis): Dispose ble	4 ()
1	om Lab X or HMI preserved by: Lab X or HMI
	DOML Plastic HNO3 - field filtered
	DOML Plastic NAOH
T	50 ml Plastic 4°C
PCE	140 ML 614.55 HCL
Sampling Personnel: J Campb	ell, (Standard
Comments: Color doe	
	s not filter out. Very hard to filter
	s not filter out. Very hard to filter



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Project Name: Ormet			Sample ID: MW-30	
Project Number: HM003.07			Replicate ID:	
Site Location: Hannibal Ohio			Time Sampling Began: 0947	
Sampling Date: 5-8-97 Wear	ther: Overcast	48°	Time Sampling Completed: 1015	
Description of Managing Point (MCI)	Top of Puc	UATION DATA		
Description of Measuring Point (MP)	TOP OF TUE	Diameter of Well	Casing 2"	<u> </u>
Total Sounded Depth of Well Below MP (TD)	60.41	Gallons to be	7	
Depth to Water Below MP (DTW)	49.02	(3 WCVs, 5 WCV		
Water Column (WC) in Well [TD-DTW]	11.39	•	GALLONS PER FOOT (gpf)	
Gallons per foot (GPF); from chart	0.16		1%"=0.06 2" = 0.16 3" = 0.37 4" =	0.65
Gallons in Well [WC x GPF]		= Well Casing Volu	me (WCV) 11%" = 0.09 21%" = 0.26 31%" = 0.50 6" =	1.47
Evacuation Method and Material	Disposable bai	ler with	poly rope	
÷	•		· ·	
	SAMF	LING DATA AND		
	FIELD	PARAMETERS		
1			T 1:1	
Color: Brown	Odor:		Turbidity: Turbid	
Temperature: (°C)	15 15	15		
pH: (S.U.)	6.33 6.39 356 338	6.45	6.47 334	
Specific Conductance: (pmhos/cm)	<i>356 338</i>	333		
Sampling Method and Material(s):	1	er with po	ly Rox	
Parameters to be Analyzed		or HMI	preserved by: Lab X_ or HMI	
Dissolved Metals	500 mL		HNO2 - field filtered	
Cranide (Total + Amenable)	500 mL		NAOH	
pH, Spland, Fluoride	250 ml		4°C	
PCE	2×40 m		HCL	
		<u>- 61400 </u>		
				
Sampling Personnel:			1 1	.,
	المطحيين ا	(54.)		
•		, <u>Stand</u>		
•			rys to 14 full builers	



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Project Name: Ormet	u	Sample ID: MW-5
Project Number: HM003.07		Replicate ID:
Site Location: Hannibal Ohio	_	Time Sampling Began: 1033
Sampling Date: 5-8-97 Weather: Ourveust	40 ^s s	Time Sampling Completed: // 20
Description of Measuring Point (MP) Top of Pt MP Elevation Total Sounded Depth of Well Below MP (TD) 91.88 Depth to Water Below MP (DTW) 45.30 Water Column (WC) in Well (TD-DTW) 26.58 Gallons per foot (GPF); from chart 0.16 Gallons in Well (WC x GPF) 4,25	Diameter of Well Casing Gallons to be Purgeo (3 WCVs, 5 WCVs, etc.	(12.8) 13
	MPLING DATA AND	поре
Color: Brown Odor:		Turbidity: Stained
- (0.)	3 6 16	final 16
pH: (S.U.) 9,15 9,1	3 9.13 9	1,20
Specific Conductance: (µmhos/cm) 1325 136	Ro 1303 1	318
1	ner Description ab X or HMI	Preservative preserved by: Lab X or HMI
Dissolved Metals 500 n	al Plastic	HNO3 - field filtered
(yanide (Total + Amenable) 500 m	nL Plastic	NAOH
pH, Sp Cond, Fluoride ason	nl Plastic	4°C
pH, Spland, Fluoride ason	nl Plastic mL 61ass	4°C



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Project Name: Ormet	Sample ID: MW-2
Project Number: HM003.07	Replicate ID:
Site Location: Hannibal Ohio	Time Sampling Began: //33
Sampling Date: 5-8-97 Weather: Overco	13+ 50's Time Sampling Completed: 1215
	EVACUATION DATA PUC Diameter of Well Casing
	SAMPLING DATA AND FIELD PARAMETERS Dispy Sheen Turbidity: Very Stained (no silt)
Temperature: (°C)	16 16 16
pH: (S.U.) 10.10	0.09 10.03 10.07
Specific Conductance: (//mhos/cm) 1845 /	452 1870 1865
Parameters to be Analyzed From Dissolved Metals 500	preservative preservative preserved by: Lab X or HMI
	OML Plastic NAOH
	omi Plastic 4°C
PCE axy	HO ML 61455 HO
Sampling Personnel: <u>J Camphe</u> Comments: <u>Color doe</u>	11, C Standard s not filter out

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Project Name: Ormet	Sample ID: MW-7
Project Number: HM003.07	Replicate ID: MW-DUP-2
Site Location: Hannibal Ohio	Time Sampling Began: 1308
Sampling Date: 5-8-97 Weather: Overco	45+ 50° Time Sampling Completed: 1340
	EVACUATION DATA PUC Diameter of Well Casing 2" (9.4) /0 (3 WCVs, 5 WCVs, etc.) GALLONS PER FOOT (gpf) 1x* = 0.06 2* = 0.18 3* = 0.37 4* = 0.65 = Well Casing Volume (WCV) 1x* = 0.09 2x* = 0.26 3x* = 0.50 6* = 1.47
	SAMPLING DATA AND FIELD PARAMETERS
Color: Brown Odor:	Turbidity: Turbid and Silty
Temperature:(°C) 40	2 3 final / 41 41 41
pH: (5.0,) 5,93	5.92 5.99 6.04
Specific Conductance: (pmhcs/cm) 711	691 678 670
Sampling Method and Material(s): Dispose ble	miler with poly Rope Intainer Description Preservative
	m Lab X or HMI preserved by: Lab X or HMI
Dissolved metals 500	OML Plastic HNO3 - field filtered
	oml Plastic NAOH
•	50 ml Plastic 4°C
Sampling Personnel: <u>J Camphe</u> Comments:	11, (Standard



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Project Name: Ormet			Sample ID: MW-10
Project Number: HM003.07			Replicate ID:
Site Location: Hannibal Ohio		•	Time Sampling Began: 1353
Sampling Date: <u>5-8-97</u> We	eather: Rain 5	<u>o*</u>	Time Sampling Completed: 1445
		· · · · · · · · · · · · · · · · · · ·	
	EVA	CUATION DATA	
	_ (_		
Description of Measuring Point (MP)	Top of Pu		
MP Elevation _		Diameter of Well (
Total Sounded Depth of Well Below MP (TD)	100.72	Gallons to be F	
Depth to Water Below MP (DTW)	71.40	_ (3 WCVs, 5 WCVs	
Water Column (WC) in Well [TD-DTW]	<u> 29.32</u>	-	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart _ Gallons in Well [WC x GPF]	<u> </u>	- - Well Casing Volum	11x" = 0.06 2" = 0.18 3" = 0.37 4" = 0.65 11x" = 0.09 2x" = 0.26 3x" = 0.50 6" = 1.47
Gallons in Well (WC x GFF)	7./	- Wen Casing Voidin	E (VVCV) 17 - 0.05 27 - 0.26 37 - 0.30 6 - 1.47
Evacuation Method and Material	Disposable ba	iler with a	who were
7			
	SAM	PLING DATA AND	
·	FIEL	D PARAMETERS	
Color: Brown	Odor:		Turbidity: Cloudy
Temperature:(º୯)	17.5 17	5 17.5	17.5
pH: (5.U,)	7.32 7.	36 7.38	7.40
Specific Conductance: (pmhcs/cm)	510 51	2 508	510
Sampling Method and Material(s):	Diagoldo h	امد بالله ما	<i>D</i> . 20
Sampling Member and Materials).		r Description	Y Rox
Parameters to be Analyzed		or HMI	preserved by: Lab X or HMI
Dissolved Metals		Plastic	HNO3 - field filtered
	500 m		NAOH
Cyanide (Total + Amenable)			<u></u>
pH, Spland, Fluoride	<u> </u>	PIGSTIC	<u> </u>
Sampling Personnel:	J Campbell	, (Standa	ard
Comments:			
	· · ·		· · · · · · · · · · · · · · · · · · ·
ļ	·		

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Project Name: OrmeT		Sample ID: MW-8
Project Number: HM003.07		Replicate ID:
Site Location: Hannibal Ohio		Time Sampling Began: 1452
Sampling Date: <u>5-8-97</u> Weather:	Rain 50°	Time Sampling Completed: 1545
ſ	EVACUATION DATA	7
·	EVACUATION DATA	
Description of Measuring Point (MP) I_{0}	p of PUC	·
MP Elevation	Diameter of Well Casi	ing O''
Total Sounded Depth of Well Below MP (TD)	99.78 Gallons to be Purg	
Depth to Water Below MP (DTW)	71 , 56 (3 WCVs, 5 WCVs, et	
· · · · · · · · · · · · · · · · · · ·	ar . 22	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16	1%" = 0.08 2" = 0.18 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	4.51 = Well Casing Volume ((WCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method and Material Disp	posable bailer with poli	y rope
,	<u> </u>	<i>i</i> '
	SAMPLING DATA AND	
	FIELD PARAMETERS	
		·
Color: None Odo		Turbidity: Clear
Temperature: (°C)		16,5
pH: (5.0,) 7.	97 7.99 7.98	8,02
Specific Conductance: (pmhcs/cm) 44	17 <u>443 444</u>	442
		Λ .
Sampling Method and Material(s): Dis	l 1	· · · · · · · · · · · · · · · · · · ·
Parameters to be Analyzed	Container Description From Lab X or HMI	Preservative preserved by: Lab X or HMI
Dissolved Metals	500 mL Plastic	HNO3 - field filtered
Cyanide (Total + Amenable)	500 ml Plastic	NAOH
pH, Spland, Fluoride	250 ML Plastic	<u>4°C</u>
		•
	• •	
Sampling Personnel: J	Campbell, (Standar	d
Comments:	1	
		•

Page <u>27</u> of <u>31</u>

Project Name: Ormet		Sample ID: MW-/
Project Number: HM003.07		Replicate ID:
Site Location: Hannibal Ohio		Time Sampling Began: 07/7
Sampling Date: <u>5-9-97</u> Weather: <u>L+</u>	Rain 50°	Time Sampling Completed: 0752
Description of Measuring Point (MP) MP Elevation Total Sounded Depth of Well Below MP (TD) Depth to Water Below MP (DTW) Water Column (WC) in Well (TD-DTW) Gallons per foot (GPF); from chart Gallons in Well (WC x GPF) Evacuation Method and Material Disposeb	Diameter of Well Casin Gailons to be Purge (3 WCVs, 5 WCVs, etc.) Well Casing Volume (W.)	od (7.8) 8
	SAMPLING DATA AND FIELD PARAMETERS	
Color: Brown Odor:		Turbidity: Turbid 5.114
Temperature:(°C) /7	17 /7	17
pH: (5.U,) (4.36	6,36 6,31	6.32
Specific Conductance: (pmhcs/cm) 429	<i>3</i> %7 376	365
	Container Description From Lab X or HMI	Preservative preserved by: Lab X or HMI
	500 mL Plastic	HAND - field filtered
	500 mL Plastic	NAOH
	250 ml Plastic	4°C



Page <u>28</u> of <u>31</u>

Project Name: OrmeT		S	ample ID: Mu) - I I
Project Number: HM003.07	····	B	eplicate ID:
Site Location: Hannihal Ohio		I	ime Sampling Began: 0800
Sampling Date: <u>5-9-97</u> Weather	r: Lt Rein 50	o I	ime Sampling Completed: 0848
	EVACUAT	ION DATA	
_	- (-		
Description of Measuring Point (MP)	op of Puc		
MP Elevation		ameter of Well Casing	
Total Sounded Depth of Well Below MP (TD)	97.35	Gailons to be Purged	(15.5) 15.5
Depth to Water Below MP (DTW)		WCVs, 5 WCVs, etc.)	
Water Column (WC) in Well [TD-DTW]	32.21		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16		1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	<u>5,15 </u>	ell Casing Volume (WC\	/) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
		•1 .	
Evacuation Method and Material Di	sposable builer	with poly 1	ope
·	8 4 4 5 1 1 1 1		
		DATA AND	
	HELD PAI	RAMETERS	
Coior: None o		_	
	dor		unhiding () or r
	dor:	3 fina	Turbidity: (ear
Temperature:(°C)	7 17	3 tina 17 17	
Temperature:(°C) 1.5.0, 7.	7 17 29 7.55	3 firm 17 17 7.56 7.6	1
Temperature:(°C) 1	7 17	3 tina 17 17	1
Temperature:(°C) 1.50H: (5.0L) 7.	7 17 29 7.55	3 firm 17 17 7.56 7.6	1
Temperature:(°C) 1.50H: (5.0L) 7.	7 17 29 7.5.5 DA 403	3 fina 17 17 7.5% 7.6 402 405	<u> </u>
Temperature: (°C) pH: (5.0,) Specific Conductance: (µmhos/cm) 41	7 17 29 7.5.5 DA 403	17 17 756 7.66 402 409 with poly Ro	<u> </u>
Temperature: (°C) pH: (5.0,) Specific Conductance: (µmhos/cm) 41	7 17 29 7.55 Da 403 isposeble bailer	17 17 756 76 402 409 with poly Ro	Pe
Temperature: (°C) pH: (5.U,) Specific Conductance: (µmhos/cm) Sampling Method and Material(s):	7 17 29 7.55 Da 403 Ispass ble hailer Container Des	17 17 17 7.5(a 7.6) 402 403 with poly Roscription or HMI	Preservative preserved by: Lab X or HMI
Temperature: (°C) pH: (5.0,) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Di Parameters to be Analyzed Dissolved Metals	7 17 29 7.55 DD 403 Spouble hailer Container Des From Lab X	17 17 7.56 7.66 402 405 with poly Roscription or HMI Plastic	Preservative preserved by: Lab X or HMI HNW3 ~ field filtered
Temperature: (°C) pH: (S.U,) Specific Conductance: (µmhos/cm) Sampling Method and Material(s): Di Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable)	7 17 29 7.55 02 403 Spossible hailer Container Des From Lab X 500 mL	17 17 756 766 402 409 with poly Rocciption or HMI Plastic Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Temperature: (°C) pH: (5.0,) Specific Conductance: (pmhcs/cm) Sampling Method and Material(s): Di Parameters to be Analyzed Dissolved Metals	7 17 29 7.55 DD 403 Spouble hailer Container Des From Lab X	17 17 7.56 7.66 402 405 with poly Roscription or HMI Plastic	Preservative preserved by: Lab X or HMI HNW3 ~ field filtered
Temperature: (°C) pH: (S.U,) Specific Conductance: (µmhos/cm) Sampling Method and Material(s): Di Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable)	7 17 29 7.55 02 403 Spossible hailer Container Des From Lab X 500 mL	17 17 756 766 402 409 with poly Rocciption or HMI Plastic Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Temperature: (°C) pH: (S.U,) Specific Conductance: (µmhos/cm) Sampling Method and Material(s): Di Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable)	7 17 29 7.55 02 403 Spossible hailer Container Des From Lab X 500 mL	17 17 756 766 402 409 with poly Rocciption or HMI Plastic Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Temperature: (°C) pH: (S.U,) Specific Conductance: (µmhos/cm) Sampling Method and Material(s): Di Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride	7 17 29 7.55 02 403 Spossible hailer Container Des From Lab X 500 mL 500 mL	17 17 756 766 402 405 with poly Roscription or HMI Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Temperature: (°C) pH: (S.U,) 7. Specific Conductance: (µmhos/cm) 4/1 Sampling Method and Material(s): Di Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride	7 17 29 7.55 02 403 Spossible hailer Container Des From Lab X 500 mL	17 17 756 766 402 409 with poly Rocciption or HMI Plastic Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Temperature: (°C) pH: (S.U,) 7. Specific Conductance: (µmhos/cm) 4/1 Sampling Method and Material(s): Di Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride	7 17 29 7.55 02 403 Spossible hailer Container Des From Lab X 500 mL 500 mL	17 17 756 766 402 405 with poly Roscription or HMI Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Temperature: (°C) pH: (S.U,) 7. Specific Conductance: (µmhos/cm) 4/1 Sampling Method and Material(s): Dr Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) pH, Spland, Fluoride Sampling Personnel: J	7 17 29 7.55 02 403 Spossible hailer Container Des From Lab X 500 mL 500 mL	17 17 756 766 402 405 with poly Roscription or HMI Plastic Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH



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Project Name: OrmeT		Sample ID: MW-28
Project Number: HM003.07		Replicate ID:
Site Location: Hannibal Ohio		Time Sampling Began: 0900
Sampling Date: 5-9-97 Weather: Over(45	+ 50.5	Time Sampling Completed: 0928
Fiv	ACUATION DATA	7
<u></u>	ACCATIONEDATA	┙.
Description of Measuring Point (MP)	JC	·
MP Elevation	Diameter of Well Casi	ng
Total Sounded Depth of Well Below MP (TD) 46,06	Gallons to be Purg	ed (12,3) 12.5
Depth to Water Below MP (DTW)	(3 WCVs, 5 WCVs, etc	c.)
Water Column (WC) in Well [TD-DTW] 25,56		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart0.16		1%"=0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Weil [WC x GPF] 4,	= Well Casing Volume (V	NCV) 1½" = 0.09 2½" = 0.26 3½" = 0.50 6" = 1.47
<u> </u>	MPLING DATA AND	пре
Color: Brown Odor:		Turbidity: Cloudy
Temperature:(°C) 15		na 5
pH: (5.0,) 7.01 6.	60 6.52 6	., <i>40</i>
	57 <u>458</u> 4	15.3
Specific Conductance: (µmhos/cm) 460 45		
Specific Conductance: (pmhos/cm) 760 4		
Specific Conductance: (pmhos/cm) 760 45 Sampling Method and Material(s): Dispose ble M	ailer with poly	lox
Sampling Method and Material(s): Dispose ble M	ner Description	Preservative
Sampling Method and Material(s): Dispose ble M Contain Parameters to be Analyzed From La	ner Description	Preservative preserved by: Lab X or HMI
Sampling Method and Material(s): Dispose ble M Contain Parameters to be Analyzed From La Dissolved Metals 500 m	ner Description ab X or HMI	Preservative preserved by: Lab X or HMI HNO3 ~ field filtered
Sampling Method and Material(s): Dispose ble in Contain Parameters to be Analyzed From La Dissolved Metals 500 m Cyanide (Total + Amenable) 500 m	ner Description ab X or HMI L Plastic L Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Sampling Method and Material(s): Dispose ble M Contain Parameters to be Analyzed From La Dissolved Metals 500 m	ner Description ab X or HMI L Plastic L Plastic	Preservative preserved by: Lab X or HMI HNO3 ~ field filtered
Sampling Method and Material(s): Dispose ble in Contain Parameters to be Analyzed From La Dissolved Metals 500 m Cyanide (Total + Amenable) 500 m	ner Description ab X or HMI L Plastic L Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Sampling Method and Material(s): Dispose ble in Contain Parameters to be Analyzed From La Dissolved Metals 500 m Cyanide (Total + Amenable) 500 m	ner Description ab X or HMI L Plastic L Plastic	Preservative preserved by: Lab X or HMI HAW3 ~ field filtered NAOH
Sampling Method and Material(s): Dispose ble in Contain Parameters to be Analyzed From La Dissolved Metals 500 m Cyanide (Total + Amenable) 500 m	ner Description ab X or HMI L Plastic L Plastic	Preservative preserved by: Lab X or HMI HANO3 ~ field filtered NAOH 4°C
Sampling Method and Material(s): Disposable in Contain Parameters to be Analyzed From La Dissolved Metals 500 m Cyanide (Total + Amenable) 500 m pH, Spland, Fluoride 250 m Sampling Personnal: J Campbell	ner Description ab X or HMI AL Plastic AL Plastic MI Plastic	Preservative preserved by: Lab X or HMI HANO3 ~ field filtered NAOH 4°C



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	·	Sample ID: MW-16
Project Number: HM003.07		Replicate ID:
Site Location: Hannibal Ohio		Time Sampling Began: 0937
Sampling Date: <u>5-9-97</u> Weather: <u>Over</u>	cast 50° Rain	Time Sampling Completed: 1018
	EVACUATION DATA	7
<u> </u>	TANGOLION OLI A	
Description of Measuring Point (MP)	Puc	
MP Elevation	Diameter of Well Cas	ing
Total Sounded Depth of Well Below MP (TD) 93.11	Gallons to be Purg	ged (16,4) 16.5
Depth to Water Below MP (DTW) 49,99	(3 WCVs, 5 WCVs, e	tc.)
Water Column (WC) in Well (TD-DTW) 34,15	2	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart 0.16	· · · · · · · · · · · · · · · · · · ·	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF] 5.43	5 = Well Casing Volume (WCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method and Material <u>Disposabl</u>	a balla a situ sal	
	e bailer with poly	y 10 pe
	SAMPLING DATA AND	
	FIELD PARAMETERS	
Color: Brown Odor:	<u>a</u> 3	Turbidity: Stained (no silt)
Temperature:(°C) 15	15 15	15
pH: (5.0,) 7.46	7.55 7.58	7,60
[9 A 1
Specific Conductance: (µmhos/cm) 411	800 797	801
Specific Conductance: (pmhos/cm) 411	300 797	
Sampling Method and Material(s): Dispose b		
Sampling Method and Material(s): Dispose b	le bailer with poly	Rope
Sampling Method and Material(s): Dispose h	le hailer with poly	Rox
Sampling Method and Material(s): Dispose h	le bailer with poly Container Description From Lab X or HMI	Preservative preserved by: Lab X or HMI
Sampling Method and Material(s): Dispose he Parameters to be Analyzed F Dissolved Metals 5 Cyanide (Total + Amenable) 5	le bailer with poly Container Description From Lab X or HMI COOML Plastic	Preservative preserved by: Lab X or HMI HNO3 ~ field filtered
Sampling Method and Material(s): Dispose he Parameters to be Analyzed F Dissolved Metals 5 Cyanide (Total + Amenable) 5	le hailer with poly Container Description From Lab X or HMI FOO ML Plastic FOO ML Plastic	Preservative preserved by: Lab X or HMI HN03 - field filtered NAOH
Sampling Method and Material(s): Dispose he Parameters to be Analyzed F Dissolved Metals 5 Cyanide (Total + Amenable) 5	le hailer with poly Container Description From Lab X or HMI FOO ML Plastic FOO ML Plastic	Preservative preserved by: Lab X or HMI HN03 - field filtered NAOH
Sampling Method and Material(s): Dispose he Parameters to be Analyzed F Dissolved Metals 5 Cyanide (Total + Amenable) 5	le hailer with poly Container Description From Lab X or HMI FOO ML Plastic FOO ML Plastic	Preservative preserved by: Lab X or HMI HN03 - field filtered NAOH
Sampling Method and Material(s): Dispose he Parameters to be Analyzed F Dissolved Metals 5 Cyanide (Total + Amenable) 5	le bailer with poly Container Description From Lab X or HMI FOOML Plastic RSO ML Plastic	Preservative preserved by: Lab X or HMI HAW2 - field filtered NAOH 4°C
Sampling Method and Material(s): Dispose by Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) PH, Spland, Fluoriale Sampling Personnel: J Camp	le bailer with poly Container Description From Lab X or HMI FOOML Plastic RSO ML Plastic	Preservative preserved by: Lab X or HMI HAW2 - field filtered NAOH 4°C
Sampling Method and Material(s): Dispose by Parameters to be Analyzed Dissolved Metals Cyanide (Total + Amenable) PH, Spland, Fluoride Sampling Personnel: J Camp	le bailer with poly Container Description From Lab X or HMI FOOML Plastic FOOML Plastic RSOML Plastic	Preservative preserved by: Lab X or HMI HAW2 - field filtered NAOH 4°C



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Project Name: Ormet			Sample ID: MW-295
Project Number: HM003.07	· · · · · · · · · · · · · · · · · · ·		Replicate ID:
Site Location: Hannibal Ohio			Time Sampling Began: 1028
Sampling Date: <u>5-9-97</u> Weather:	Overcast.	50°	Time Sampling Completed: ///O
<u></u>			7
L	EVACUAT	TION DATA	
_	•		·
Description of Measuring Point (MP)	of Puc		<u> </u>
MP Elevation	Di	ameter of Well Casing	3 <u>_2"</u>
Total Sounded Depth of Well Below MP (TD)	61,35	Gallons to be Purged	i <u>(3,2) 13,5</u>
Depth to Water Below MP (DTW)	40,10 (3	WCVs, 5 WCVs, etc.)
Water Column (WC) in Weil [TD-DTW]	21.25		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart	0.16		11/4" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF]	<i>3.4</i> = w	eil Casing Volume (W	CV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method and Material Disp	osable bailer	- with poly	rope
, ; ,			7
	SAMPLING	G DATA AND	
' <u>[</u>	RELD PA	RAMETERS]
1			
Color: Lt. Tan Odos	r: 2	3 11	Turbidity: Very SI. Cloudy
Temperature: (°C) /6.	5 16	• •	6
pH: (5.U,) 8.	3.3 8.42	8.41 8	.93
Specific Conductance: (µmhos/cm) 176	0 1753	1740 1	735
			
Sampling Method and Material(s): Disc	are lle briles	. h l . /) <u></u>
Sampling Method and Material(s):	Container Des		Preservative
Parameters to be Analyzed	From Lab X	•	preserved by: Lab X or HMI
			•
Dissolved Metals	500 mL		HANDS - field filtered
Cyanide (Total + Amenable)			NAOH
pH, Spland, Fluoride	250 ml	Plastic	<u> 4°C</u>
			·
·			
Sampling Personnel: J (Campbell . 1	Standard	·
•			28 for above Parameters
1		The state of the s	THE MADOC TATAMETERS
			
<u> </u>	· · · · · · · · · · · · · · · · · · ·		

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APPENDIX A-2

WATER SAMPLING LOG FORMS FOR MAY 1998 MONITORING EVENT



PROJECT NO:	HM003.03	WELL(S):	mw-1532,35,37,41,19
LOCATION:	Hannibal Ohio	DATE:	5-4-98
SAMPLING PERSONNEL:	J Campbell S Menasky	TIME:	
COMPLETED BY:	J Campbell		

ITEMS	ОК	NA	NOTES
PRIOR TO SAMPLING		<u></u>	
Health & safety plan; reviewed; equipment ready.	V		}
Sample containers, coolers, received from laboratory; ice or ice	,		
pack and coolers ready.	V		
Sampling equipment and supplies inventoried, clean and			
operational.	1		
On - site client contact notified.	V		
Condition of well noted.	V		
Well area prepared for sampling; plastic placed around well;			
gasoline - powered pumps placed downwind.			
Water-level measurements made and recorded on			
Water Sampling Log with other pertinent field information.			
Field instruments calibrated; calibration recorded in field logbook	1		PH 7 40,70,100 SPC 700 pmhos
Sample containers labelled; preservatives added, if necessary.	V		
DURING AND AFTER SAMPLING:			At Least 3% with
Three to five well volumes purged.			10% Parameters Stabilized
Sample collected using a bailer or pump as per sampling plan.	V		disposable hailer
Measurement of field parameters recorded on Water Sampling		Ç.	
Log and in field log book.	V		
Sample containers filled according to collection protocol of			
analyses.	V		
Field and trip blanks collected; replicates or split samples			mw-32 dup is mw-32d
collected and recorded in field log book.	1		•
Samples stored on ice in coolers.	<u></u>		
Water Sampling Log and Chain-of-Custody Recorded completed.	~		·
Reusable equipment decontaminated; non-reusable equipment			
disposed of in appropriate manner.			
Well secured and locked.			

additional Comments: used imicron filters for dissolved metals



PROJECT NO:	H m003.08	WELL(S): m	Mw - 39s, 34d w <u>-8, 10, 7, 11, 1, 38, 40d, 40</u> s
LOCATION:	Ormet	_	5-5-98
SAMPLING PERSONNEL:	JC/SM	TIME:	
COMPLETED BY:	JC		

ITEMS	ОК	NA	NOTES
PRIOR TO SAMPLING			
Health & safety plan; reviewed; equipment ready.	V		
Sample containers, coolers, received from laboratory; coor ice			
pack and coolers ready.	~		
Sampling equipment and supplies inventoried, clean and			
operational.			
On-site client contact notified.	L		
Condition of well noted.	4		
Well area prepared for sampling; plastic placed around well;			
gasoline - powered pumps placed downwind.			
Water - level measurements made and recorded on			
Water Sampling Log with other pertinent field information.	1 V		
Field instruments calibrated; calibration recorded in field logbook	~		PH 4,7410 SPC 700 +3900
Sample containers labelled; preservatives added, if necessary.	~		
DURING AND AFTER SAMPLING:			
Three to five well volumes purged.	4		10% Stabilization
Sample collected using a bailer or pump as per sampling plan.	1		
Measurement of field parameters recorded on Water Sampling			
Log and in field log book.	レ		
Sample containers filled according to collection protocol of	1-		
analyses.			
Field and trip blanks collected; replicates or split samples			mw-11 (mw-11d is dop)
collected and recorded in field log book.	<u></u>		
Samples stored on ice in coolers.	<u></u>		
Water Sampling Log and Chain-of-Custody Recorded completed.	1		
Reusable equipment decontaminated; non-reusable equipment			
disposed of in appropriate manner.	レ		
Well secured and locked.	~		

dditional Comments:



			PCE Also
PROJECT NO:	Hm003.08	WELL(S): ma	v-2,5,18,30,31, 12,426,42d,16
LOCATION:	Ormet	DATE:	5-6-98
SAMPLING PERSONNEL:	JC 15M	TIME:	
COMPLETED BY:	JC		

ITEMS	ОК	NA	NOTES
PRIOR TO SAMPLING			
Health & safety plan; reviewed; equipment ready.			
Sample containers, coolers, received from laboratory (ice or ice			
pack and coolers ready.	1		
Sampling equipment and supplies inventoried, clean and			
operational.	-		
On - site client contact notified.	4		
Condition of well noted.	v		
Well area prepared for sampling; plastic placed around well;			
gasoline - powered pumps placed downwind.	-		-
Water - level measurements made and recorded on			
Water Sampling Log with other pertinent field information.	-		
Field instruments calibrated; calibration recorded in field logbook	-		pH 4,7+10; 5pc 700+3900
Sample containers labelled; preservatives added, if necessary.	1		
DURING AND AFTER SAMPLING:			
Three to five well volumes purged.	1		10% Stabilization
Sample collected using a bailer or pump as per sampling plan.	~		
Measurement of field parameters recorded on Water Sampling			
Log and in field log book.	L		
Sample containers filled according to collection protocol of			
analyses.		ļ	
Field and trip blanks collected; replicates or split samples			Trip Blank (PCEONLY)
collected and recorded in field log book.	-	Ì	Mw-5 (mw-5d is dup) PCF Also
Samples stored on ice in coolers.	<u></u>		
Water Sampling Log and Chain - of - Custody Recorded completed.	<u></u>		
Reusable equipment decontaminated; non-reusable equipment			
disposed of in appropriate manner.	レ		
Well secured and locked.	V		

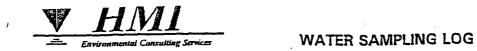
.dditional Comments:



PROJECT NO: _	Hm003.08	_ WELL(S):	mw-34d, 17, 29, 29d,
LOCATION:	Ormet		5-7-98
SAMPLING PERSONNEL: _	JC/5m	TIME:	
COMPLETED BY:	TC		

ITEMS	OK	NA	NOTES
PRIOR TO SAMPLING			
Health & safety plan; reviewed; equipment ready.	1		
Sample containers, coolers, received from laboratory; ice or ice			
pack and coolers ready.	V		
Sampling equipment and supplies inventoried, clean and			
operational.			
On-site client contact notified.	1		
Condition of well noted.	-		
Well area prepared for sampling; plastic placed around well;	ا ــ ا		
gasoline - powered pumps placed downwind.			
Water-level measurements made and recorded on			
Water Sampling Log with other pertinent field information.			
Field instruments calibrated; calibration recorded in field logbook	1		pt 4,7410 ; 5pc 700+3900
Sample containers labelled; preservatives added, if necessary.	-	·	, ,
DURING AND AFTER SAMPLING:			
Three to five well volumes purged.	V	· · · · · · · · · · · · · · · · · · ·	10% Stabilization
Sample collected using a bailer or pump as per sampling plan.	L	····	·
Measurement of field parameters recorded on Water Sampling			
Log and in field log book.	-		•
Sample containers filled according to collection protocol of]		
analyses.	-		
Field and trip blanks collected; replicates or split samples			Field Blank
collected and recorded in field log book.			
Samples stored on ice in coolers.	-		
Water Sampling Log and Chain - of - Custody Recorded completed.	レ		
Reusable equipment decontaminated; non-reusable equipment			
disposed of in appropriate manner.	-		
Well secured and locked.	U		

.dditional Comments:



Page	af	
	 Ψ.	

Project Name: Ormet						Sam	ple ID: MW-1	
Project Number: HM003.0	7			Replicate ID:				
Site Location: Hannihal	onio			-			s Samoling Began:	1005
Sampling Date: _ 5/5/91	<u>8</u>	Weather: _	Rain;	505		Tim	e Sampling Complete	d: 1025
·								
				 			,	
		<u> </u>	EV	ACUATION	DATA			
		. T	(B.c.				
Description of Measuring			p ot	PVC			a"	
	MP Elevation		/ tt	_	er of Weil C	•		<u></u>
Total Sounded Depth of Well Be			[.]] [.39	_	ons to be P	•	·_ <i>ō</i>	
Depth to Water Belo Water Column (WC) in W			.72	_ 13 44C1	's, 5 WCVs,	, e.c.,	GALLONS	PER FOOT (gpf)
Gallons per foot (GPF			./a).16	_			1%" = 0.06 2" = 0.1	
Gallons per 1001 (GFF			2.52	— = Well C:	eina Volum	e WCV		25 3½" = 0.50 6" = 1.47
Gallons in Wei	1 (WC X G. 1	, <u></u>	x.56		Bing Foldin	, (11 01)	· // - 0.03	32 - 0.30 0 - 1.47
Evacuation Method	and Materia	i Dison	schle 1	nailer	with	poly p	opylene rope	
			Sugar L	201 (6)	W1 1/1	PHY	pyres 10pc	
<u> </u> 	•		SAN	MPLING DA	TA AND			
			FIE	LD PARAM	ETERS			
Color: Brown		Odort	-7			Turi	oidity: Turb	id
Well Volumes	155	and	3rd	4 Th	5 Th	final		·
pH:	5.7a	5.68	5.66			5.65	•	·
Specific Conductance:	520	500	495	<u> </u>		505		
Temperature:	15	15	15	L		15	<u> </u>	
		D'	. h.l. la	1.	.1	1	- 1	
Sampling Method an	d Material(s	1: <u>Uispo</u>				plypro	•	
December to be Aucher		•		er Descript				ervative Lab X or HMI
Parameters to be Analyz				b <u>X</u> or H				
Diss As, Be, Mn, Na	•			L Plas			•	iltered Imicron
Cn-total, Cn-am	enable			L Plas			NAOH	
Spec Cond, pH, F			250 n	nl Pla	stic	·	<u>4°C</u>	
: }		· -						
		_						
Sampling Po	ersonnei:	Ja	umphell	. 5	Menosk	CV		
Co	mments:		7	7		7		
1								
								
								



Page ____ of ___ Sample ID: MW-2

Project Name: Ormet				_		Sam	ile ID: MW-2	÷
Project Number: HM003.C	7			_		Repli	cate ID:	
Site Location: Hannihal	-					Time	Sampling Began:	0705
Sampling Date:		Weather: _	oggy .	<u>56's</u>		Time	Sampling Completed	: 0740
			EVA	CUATION	ATA			
Description of Measuri	ng Point (MP	1 <u>To</u>	pof	PUC	·			
	MP Elevation	`	·	Diamete	er of Well C	asing	a"	
Total Sounded Depth of Well B	elow MP (TD		5.23	Gall	ons to be P	urged <u>.</u>		
. Depth to Water Beid	W MP (DTW	n <u>58</u>	.99	_ (3 MCA	s, 5 WCVs,	, etc.)		
Water Column (WC) in W	/eil ITD-DTW	n <u>a</u> u	.24	_		Ļ	GALLONS F	PER FOOT (gpf)
Gallons per foot (GPF); from chart 0.16					3" = 0.37 4" = 0.65			
Gallons in We	ell [WC x GPF	7 <u>4</u>	. a	_= Well Ca	sing Volum	e (WCV)	1%* = 0.09 2%* = 0.26	3%" = 0.50 6" = 1.47
Evacuation Method	i and Materia	u Dispo		··· -		poly pro	opylene rope	
		į		MPLING DA				
		<u>_</u>	FIE	LD PARAM	ETERS			
	1.			-1			:	
Color: Dk brown-blas	CK , ST	a rd	3rd	- sheen 4 th	5 Th	final	idity: Stained	
Well Volumes	 	l		7	3	10.24		
pH:	1870	1875	1870			1880	 	
Specific Conductance: Temperature:	13.5	14	1670			14	 	
								
Sampling Method a	nd Material(s	i: Dispo	sable b	xiler 1	vith o	plypros	ovlene rope	
		1.		ner Descript		77		ervative
Parameters to be Analy	zed		From La	ab <u>X</u> or H	Mi		preserved by:	Lab 🗶 or HMI
Diss As, Be, Ma, No			.500 m	L Plas	lic		HNO2- field f.	Hered Imicron
Cn-total, Cn-an	-			L Plas			NAOH	
						··	4°C	
PCE PCE	Spec Cond, pH, F 250 mL Plastic PCE 2x40mL Glass				HCL			
1 4 6 6			<u> </u>	191 <u>0 (</u>	455		1/02	
								
	3	+/	.111	•	100	l		
Sampling i			imphell	•	<u>Menosl</u>	7.		
1	omments:		v does	not +	-1ter o	<u> </u>		
!								
	·		·					



Page ____ of ____

Project Name: Ormet		·		-		Sam	pie ID: MW-5	
Project Number: HM003.07						Replicate ID: MW-5d		
Site Location: Hanniha	, Ohio			-		Time	Sampling Began: 0750	
Sampling Date: 5/6/9	81	Weather: _1	fogy 50	<u>){</u>		Time	Sampling Completed: 0820	
			EVA	CUATION	DATA			
Description of Measuri	ng Point (MP	To.	o of	PVC				
	MP Elevation	1	l	Diamet	er of Well C	asing	a"	
Total Sounded Depth of Well B	elow MP (TD	9	<u>91,88</u> G			urged	12	
Depth to Water Bek	W MP (DTW	67	67, 25 (3 WCVs, 5 W			etc.)		
Water Column (WC) in W	/eii [TD-DTW	12	1.63	_			GALLONS PER FOOT (gpf)	
Galions per foot (GP	F); from char	t	0.16	-			1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65	
Gallons in We	ii (WC x GPF	ī	3.95	_= Well Ca	sing Volum	e (WCV)	1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
Evacuation Method	d and Materia	"_Dispo				poly p	opylene rope	
		ĺ		MPLING DA				
		<u></u>	FIE	LD PARAM	ETERS			
Colon In the	٠	Odora				Turi	pidity: Stained	
Well Volumes	,51	and	3rd	4th	5Th	final	J. S.	
pH:	8.75	8.84	8.84			8.84		
Specific Conductance:	1340	1350	1340			1340		
Temperature:	14.5	14.5	14.5			14.5		
	nd Material(s): <u>Dispo</u>	seble b		- 1	oly pro	pylene rope	
	•			er Descript			Preservative	
Parameters to be Analy	From Lab X or HMI					preserved by: Lab X or HMI		
Diss As, Be, Ma, No	500 ml Plastic					HNOZ-field filtered Imicron		
Cn-total, Cn-an	_ 250 ml Plestic					NAOH		
Spec Cond, pH, F	250 ml Plastic					<u>4°C</u>		
PCE			2×40	mL GI	455		HCL	
								
Sampling I	Personnel: omments:		umphell r does	not f	Menosl : Iter ou	<u>ky</u>		
								



Page of _	
7	
0920	
ted: 09 40	

Project Name: OrmeT			· — · · · · · · · · · · · · · · · · · ·				liant ID.		
Troject Harrison HTMD, 310							eplicate ID: Time Sampling Began; 0920		
Site Location: Hannibal, Ohio Sampling Date: 5/5/98 Weather: Rain 50's									
Sampling Date: <u>5/5/9</u>	š `	Weather:	Kain S	05_		Tim	e Sampling Completed: 09 40		
									
•		Г							
		L	EV	ACUATION	DATA				
			(•					
Description of Measuring			p of	PVC			- "		
	MP Elevation				er of Well C		_a"		
Total Sounded Depth of Well Be			1.70	_	ons to be P				
Depth to Water Belo			1.05	_ (3 MC/	's, 5 WC√s	, etc.)			
Water Column (WC) in W			5.65				GALLONS PER FOOT (gpf)		
Gallons per foot (GPF			2.16	_			11/2" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65		
Gallons in We	II (WC × GPF	7	<u>ა</u>	_= Well Ca	ising Volum	ie (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47		
·									
Evacuation Method	and Materia	" Dispo	sable_1	bailer	with_	poly p	copylene cope		
									
		į		MPLING DA					
		<u>!</u>	FIE	LD PARAM	ETERS				
<i>n</i>						<u>.</u>	· · · · · · · · · · · · · · · · · · ·		
Color: Brown	.5	Odor:	3rd	4 th	5 Th	final	bidity: Turbid		
Well Volumes	 	2 WCI .		1-7-	3-	T			
pH:	5,58	5.68	5.70	 		5.69			
Specific Conductance:	720	905	900	 		900			
Temperature:	41	41	1 71	L	L	141			
Sampling Method ar	d Material(s	: Dism	v.hle h	riler	with F	where	Dulene vole		
Campining Mounes C		0,0,00		ner Descript	. 1	217710	Preservative		
Parameters to be Analyz	æd			b X or H			preserved by: Lab X or HMI		
	_						HNO2- field filtered Imicron		
Diss As, Be, Ma, No.	_ **					•			
Cn-total, Cn-am	•					NAOH			
Spec Cond, pH, F	250 ml Plastic					<u>4°C</u>			
							·		
: 									
:									
Sampling P	ersonnei:	J Co	unphell	, 5	Menosi	kv			
Co		1	_,		7				
1									
•									



Page of
Sample ID: MW-8
Replicate ID:
Time Sampling Began: 0725
Time Sampling Completed: 0750
<i>-</i>
a 2"
,
GALLONS PER FOOT (gpf)
1½" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
CV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
y propylene rope
· ·

District District A				-		Sam	ple ID: MW-8			
Project Number: HM003.07				_	Replicate ID:					
Site Location: Hannihal, Ohio				_	Time Sampling Began: 0725					
Sampling Date: _5/5/98	<u>′ </u>	Weather: <u>(</u>	ight la	760		Time	Sampling Completed: D750			
,										
						 ;				
		1	EVA	CUATION	DATA					
			^							
Description of Measurin	ig Point (MP	1_Top	o of	PVC.						
!	MP Elevation	`		_ Diamet	er of Well C	asing	a"			
Total Sounded Depth of Well Be	low MP (TD	99	7.78	_ Gall	ons to be P	urged _	12.5			
Depth to Water Below	w MP (DTW	7-	1,40	_ (3 WCV	s, 5 WCVs	, etc.)	· · · · · · · · · · · · · · · · · · ·			
Water Column (WC) in We	eil [TD-DTW	1	5.38				GALLONS PER FOOT (gpf)			
Gallons per foot (GPF	; from char	tC	1.16	_			11%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.55			
Gallons in Well	I (WC x GPF	<u> </u>	1.1	_= Well Ca	sing Volum	e (WCV)	11/4" = 0.09 21/4" = 0.26 31/4" = 0.50 6" = 1.47			
							,			
Evacuation Method	and Materia	" Dispo	sable l	pailer	with	poly pri	opylene rope			
		'	 -				•			
			SAI	MPLING DA	TA AND					
		L	FIE	LD PARAMI	ETERS	1				
Color: Lone	,31	and.	3 00	4 m	5 Th	T	oidity: Clear			
Well Volumes	 			4	5	final				
pH:	7.28	7.49	7.55			7.60				
Specific Conductance:	500	505	506			14.5				
Temperature:	14.5	14.5	14,5	Li	L	1 7 7,5	-			
Sampling Method an	d Material(s	: Dispos	while h	riler .	with r	wh aras	oulene rope			
Camping means		- OBPO		er Descripti	,	~ , , , , , ,				
				e vesuio	on .		Preservative			
Parameters to be Analyz	ed					•	Preservative			
			From La	b <u>X</u> or H	MI	,	Preservative preserved by: Lab X or HMI			
Diss As, Be, Ma, No	,		From La .500 M	b <u>X</u> or Hi L <u>Plas</u> t	MI		Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron			
Diss As, Be, Mn, No Cn-total, Cn-am	,		From La .500 M 250 M	b_X or H L_Plast L_Plast	MI lic hic		Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH			
Diss As, Be, Ma, No	,		From La .500 M 250 M	b <u>X</u> or Hi L <u>Plas</u> t	MI lic hic		Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron			
Diss As, Be, Mn, No Cn-total, Cn-am	,		From La .500 M 250 M	b_X or H L_Plast L_Plast	MI lic hic		Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH			
Diss As, Be, Mn, No Cn-total, Cn-am	,	 	From La .500 M 250 M	b_X or H L_Plast L_Plast	MI lic hic		Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH			
Diss As, Be, Mn, No Cn-total, Cn-am	,		From La .500 M 250 M	b_X or H L_Plast L_Plast	MI lic hic		Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH			
Diss As, Be, Mn, No Cn-total, Cn-am	, V enable		From La .500 M 250 M	b_X or H L_Plast L_Plast	MI lic hic		Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH			
Diss As, Be, Mn, No. Cn-total, Cn-am Spec Cond, pH, F Sampling Pa	, V enable	J (a	500 m 250 m 250 m	b_X or H L_Plast L_Plast	MI tic stic		Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH			
Diss As, Be, Mn, No. Cn-total, Cn-am Spec Cond, pH, F Sampling Pa	enable	J (a	500 m 250 m 250 m	b_X or H L_Plast L_Plast	MI tic stic		Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH			



Page of
MW-10
legan: 0755 Completed: 0628
ALLONS PER FOOT (gpf)
2" = 0.16 3" = 0.37 4" = 0.65 2%" = 0.26 3%" = 0.50 6" = 1.47
rope

Project Name: Ormet				_		San	noie ID: MW-	10	
Project Number: HM003.07									
Site Location: Hannihal, Ohio						Tim	e Sampling Began:	0755	
Sampling Date: 5/5/98 Weather: Light Rain					<u> </u>	Tim	e Sampling Complete	ed: 0828	
									
		<u> </u>	EV	ACUATION	DATA				
Description of Measurin	g Point (MP	To	p of	PVC					
·	MP Elevation		1		ter of Well (Casing	_a"_		
Total Sounded Depth of Well Be	low MP (TD	10	100.72 Gallons to be Purged				_13		
Depth to Water Below									
. Water Column (WC) in W			16.08				GALLONS	PER FOOT (gpf)	
Gallons per foot (GPF			0.16				1%" = 0.06 2" = 0.1	i6 3° = 0.37 4° = 0.65	
Gallons in Wel			4.2	— = Well C	asing Volum	ne (WCV)	1%"=0.09 2%"=0.3	26 3%" = 0.50 6" = 1.47	
			· · · · · · · · · · · · · · · · · · ·		-	'			
Evacuation Method	and Materia	al Dispo	schle 1	hailer	with	poly ne	copylene cope		
TAGGGGGG 11 111-001-0-0				591761	<u> </u>	Pory	Sylvin Tope		
			SAI	MPLING DA	TA AND				
				LD PARAM					
		<u>'</u>							
Color: Brown		Odor:				Tur	bidity: VCloudy	1-Tuchiel	
Well Volumes	IST	and	3rd	4m	5Th	final		, , , , , , , , , , , , , , , , , , , ,	
pH:	7.08	7.21	7.23			7,23			
Specific Conductance:	1170	1100	1095			1110			
Temperature:	22.5	aa	22			122			
									
Sampling Method an	d Material(s	1: <u>Dispo</u>	sable b	ailer	with s	plypro	pulene rope	,	
		- T		ner Descript	,	. 17	· ·	servative	
Parameters to be Analyz		From La	1b <u>X</u> or F	IMI	•	preserved by: Lab X or HMI			
Diss As, Be, Ma, Na	500 mu Plastic					HNO3- field filtered Imicron			
						NAOH			
Cn-total, Cn-am	_ /-								
Spec Cond, pH, F	250 ml Plastic					46			
								·	
: !									
Sampling Pr	ersonnel:	Ja	umphell	5	Menos	kv			
Co	mments:		1	7		/			
!			·						
									
1									



Ormet

Sampling Date: __5/5/98

Hm003.07

Description of Measuring Point (MP)

Depth to Water Below MP (DTW) Water Column (WC) in Well [TD-DTW]

Gallons per foot (GPF); from chart

Gallons in Well [WC x GPF] -

Total Sounded Depth of Well Below MP (TD)

MP Elevation

Hannihal, Ohio

Weather: __

Project Name:

Project Number:

WATER SA

SAMPLING LOG	Page of
-	Sample ID: MW-I
•	Replicate ID: MW-11d
	Time Sampling Began: 0840
703	Time Sampling Completed: 0912
	-,
ACUATION DATA	<u> </u>
PVC	Δ [#]
	ng
PVC Diameter of Well Casin	ed .155
PV C Diameter of Well Casin Gallons to be Purge	ed .155
PV C Diameter of Well Casin Gallons to be Purge	ng _ 2 nd .155 n.)

Evacuation Method and Material Disposable bai

30,16 0.16

4.43

SAMPLING DATA AND FIELD PARAMETERS

Color: None		Odor:				ity: Clear	
Well Volumes	125	and	370	4th	5 Th	final	
pH:	7,34	7.54	7.56			7,57	
Specific Conductance:	500	504	504			507	
Temperature:	14.5	14.5	14.5			14.5	

Sampling Method and Material(s): Disposable bailer with polypropylene rope

Container Description preserved by: Lab X or HMI From Lab X or HMI Parameters to be Analyzed HNO2- field filtered / micron Diss As, Be, Mn, Na, V Cn-total Cn-amenable NAOH Spec Cond, pH, F

> J Campbell, S Menosky Sampling Personnel: Comments:



Environmental Consulti	ing Services		WATER	RSAMP	LING LO	OG		Page of
Project Name: Ormet					o	Sar	nole ID: MW	-12
Project Number: HM003.	07					Ren	olicate ID:	
	1, Ohio					Tim	ne Sampling Began:	1255
Sampling Date: 5/6/9		Weather:	Sunny	ોજ		Tin	ne Sampling Complet	ed: 1322
			EV	ACUATION	DATA			
Description of Measur	ing Point (MP	n To	p of	PUC				
	MP Elevation	n		Diamet	ter of Well (Casing	_a"	
Total Sounded Depth of Well E	Below MP (TD)(8.24	Gal	lons to be F	urged	<u>a.5</u>	
Depth to Water Bel	ow MP (DTW		24.09	(3 MC/	/s, 5 WCVs	, etc.)		
Water Column (WC) in V	Weii IIO-OTW	n	14.15	_			GALLONS	S PER FOOT (gpf)
Gallons per foot (GF	PF); from char	t	0.16				1%" = 0.06 2" = C.	.16 3" = 0.37 4" = 0.65
Gallons in W	eil (WC x GPF	T	7.1	= Weil C	asing Volum	ie (WCV)	1%"=0.09 2%"=0.	26 3%" = 0.50 6" = 1.47
		Odor	SA Fie	MPLING DA	TA AND		ropylene rope	
Well Volumes	, 31	and	· 3 rd	4 Th	5 th	final	LIEAT	
pH:	7.30	7.40	7.40	'	-	7.43		
Specific Conductance:	548	550	550	†		550		
Tamperature:	160	16	160			16		
Sampling Method a Parameters to be Analy	and Material(s	•	Contain From La	ner Descript ab <u>X</u> or H	ion '	oly pro	preserved by:	: Lab X or HMI
Diss As, Be, Ma, No	:, V			il Plas			•	filtered Imicron
Cn-total, Cn-an	nenable			NL Plas	_		NAOH	
Spec Cond, pH, F			250 n	nL Pla	stic		4°C	
Sampling	Personnel:	J	amphell	,:5	Mewosi	ky		



Environmental Consultin	ng Services		WATE	R SAMP	LING L	og	Page of	
Project Name: Ormet						San	nple ID: MW-15	
Project Number: HM003.0) 7					Rep	licate ID:	
Site Location: Hanniha				- .		Tim	e Sampling Began: 0950	
Sampling Date: 5/4/9	,	Weather: _	overcast	600		<u>Tim</u>	e Sampling Completed: 1015	
Description of Measuri Total Sounded Depth of Well B Depth to Water Bek Water Column (WC) in W Gallons per foot (GP Gallons in We Evacuation Method	MP Elevation elow MP (TE ow MP (DTW Vell (TD-DTW F); from chair (WC x GP)	n 500 5 500 500 500 500 500 500 500 500	7.86 8.13 7.73 0.16 3.16	Gall (3 WCV = Well Ca	er of Well (ions to be F /s, 5 WCVs asing Volum	Purged i, etc.) ne (WCV)	3" 9,5 GALLONS PER FOOT (gpf) 1%=0.06 2=0.16 3=0.37 4=0. 1%=0.09 2%=0.26 3%=0.50 6=1 Copylene Cope	
		1	FIE	LD PARAM	ETERS			
Color: Brown Black		Odor:				Tur	bidity: Stained + 51 Cloudy	
Well Volumes	151	and	. 3rd	1 4th	5 Th	final		
pH:	1.48	6.65	6.72			10.78		
Specific Conductance:	626	615	630			6 25		
Temperature:	14	14	14			14		
Parameters to be Analy. Diss As, Be, Ma, No. Cn - total, Cn - am Spec Cond, pH, F	zed): <u>Dispe</u>	Contain From La 500 m 250 m	pailer in the plasman	ion MI Hic	soly pro	pylene rope Preservative preserved by: Lab X or HMI HNO3- field filtered I micro NAOH 4°C	
Sampling F	Personnel:		amphell v filte	1	Menosi ; hav	7	filter	

V HMI										
Environmental Consultin	g Services		WATE	R SAMP	LING LU)G			Page	of
Project Name: Ormet						San	nole ID:	nw-14		
Project Number: HM003.0	\7			_		Rep	licate ID:			
Site Location: Hannihal				_		Tim	e Sampling I	Began:	1455	-
Sampling Date: 5/6/9		Weather: _	Sunny ?	70		Tim	e Sampling (Completed	: 1630	
			FV	ACUATION	DATA					
		<u>-</u> -		HOUNTH	<u> </u>					
Description of Measuri	ng Point (MF	7 To	o of	PVC						
·	MP Elevation		1		er of Well C	Casing	a"			
Total Sounded Depth of Well Bo	elow MP (TC	3) 8	3.11	Gall	lons to be P	urged	·			
Depth to Water Beig	w MP (DTW	n 44	7.74	(3 WC/	s, 5 WCVs	, etc.)				
Water Column (WC) in W	/ell (TD-DTW	$n_{\underline{}3}$	3,37				G	ALLONS P	ER FOOT	(gpf)
Gallons per foot (GPI	F); from char	rt	0.16	_			1 % = 0.06	2" = 0.16	3" = 0.3	37 4° = 0.65
Gallons in We	II (WC x GPF	Fj	5.33	_= Well Ca	sing Volum	e (WCV)	1 % = 0.09	2%" = 0.26	3%" = 0.	50 6" = 1.47
Evacuation Method	i and Materia	al Dispo	sable	bailer	with	poly p	ropylene	rope		
		, 		·· ·····		, , ,	,,	•		
•		1	SA	MPLING DA	TA AND					
		<u>i_</u>	FE	LD PARAM	ETERS					
<i>.</i> D							bidity: 5ta	1		
Color: Brown	1,55	Odor:	. 3rd	4th	5Th	final	bidity: 3/a	1700		
Well Volumes	 	7.7	7.7	7	3	7.7	- 			
pH:	7.40	770	765			760	+			
Specific Conductance:	14.5	14.5	14.5	 		14.5	1	·		
Temperature:				<u> </u>						· · · · · · · · · · · · · · · · · · ·
Sampling Method ar	nd Material(s	: Dispo	sable k	eiler i	with F	plypro	pylene	rope		
		•		ner Descripti		<i>"</i>	′ /	• •	rvative	
Parameters to be Analyz	zed		From La	ab <u>X</u> or H	мі		prese	rved by: L	ab 🗶 o	r HMI
Diss As, Be, Ma, No	, V		_500 m	L Plas	lic		HNO3-	field fil	ltered	1 micron
Cn-total, Cn-am	-		250 m	L Plas	lic	-	NAOH			
Spec Cond, pH, F	····		250 r	nl Pla	stic		4°C			
1 1										
:										

J Campbell, S Menosky

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Sampling Personnel:



Page	af	

Project Name: Ormet				_	Sample ID: MW-17					
Project Number: HM003.0	Project Number: HM003.07						Replicate ID:			
Site Location: Hannihal, Ohio						Time	e Sampling Began: 6825			
Sampling Date: 5/7/9	8	Weather: <u>(</u>	Loudy G	005		Time	e Sampling Completed: 0855			
			<u>.</u>							
		_				;				
		1_	EVA	CUATION	DATA					
·										
Description of Measuri	ing Point (MF	7 <u>To</u>	p_of	PVC						
	MP Elevatio	n		_ Diamet	er of Well (Casing	_ <u>a"</u>			
Total Sounded Depth of Well B	eiow MP (TC		7,91	_ Gal	lons to be P	urged	19.5			
Depth to Water Belo	W MP (DTW	n3	7.99	_ (3 MC/	s, 5 WCVs	, etc.)				
Water Column (WC) in W	Veli ITD-DTW	n3	9,92	_			GALLONS PER FOOT (gpf)			
Gallons per foot (GP			2.16	_			$1\%^{\circ} = 0.06$ $2^{\circ} = 0.16$ $3^{\circ} = 0.37$ $4^{\circ} \approx 0.65$			
Gallons in We	ii [WC x GPI	7	0.4	_= Weil C	asing Volum	ne (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47			
				- 1	. •		ı			
Evacuation Method	and Materia	a Dispo	sable l	gailer	with	poly pr	opylene rope			
		-								
		1		MPLING DA		ļ				
		<u> </u>	FIE	LD PARAM	ETERS					
Color Da		Odor:				Turi	pidity: Turbid			
Coior: Brown Well Volumes	,51	and.	3rd	4th	5 Th	final	pidity: Turbid			
pH:	7.15	7.35	7.38		 	7.4				
Specific Conductance:	570	590	580			580				
Temperature:	14	13.5	13.5			13.5				
	<u></u>			·						
Sampling Method a	nd Material(s	: Dispo	seble b	ailer i	with F	plypro	pylene rope			
		•	Contain	er Descript	ion /	. * * * * * * * * * * * * * * * * * * *	Preservative			
Parameters to be Analys	zed		From La	b <u>X</u> or H	MI		preserved by: Lab X or HMI			
Diss As, Be, Ma, No	, V		500 m	L Plas	lic		HNO3- field filtered Imicron			
j .	Cn-total, Cn-amenable 250 ml				tic		NAOH			
Spec Cond, pH, F			250 n	L Pla	stic		4°C			
7-2011										
										
										
Sampling F	ersonnei:	70	imphell	<	Moune	k.c				
_	omments:	<u></u>	WILL	1-3	TIKYUSI	7				
1										
İ										
l										



Page of
10-18
egan: 0930 Completed: 1007

Project Name: Ormet				_		San	Sample ID: I/IW-18			
Project Number: HM003.0	7			-			Replicate ID:			
Site Location: Hannihal, Ohio						<u>Time</u>	e Sampling Began: 0930			
Sampling Date: 5/6/9	<u>s</u> '	Weather:	Sunny (00°		Time	e Sampling Completed: 1007			
			· · · · · · · · · · · · · · · · · · ·							
	•					 ;				
		_	EVA	CUATION	DATA					
			^							
Description of Measuri	ng Point (MP	1To	p of	PVC						
:	MP Elevation	"	· 	_ Diamet	er of Well C	asing	a"			
Total Sounded Depth of Well Bo	elow MP (TD	159	<u>3.00</u>	Gal	lons to be P	urged	9			
Depth to Water Belo	W MP (DTW	140	.19	_ (3 MC/	/s, 5 WCVs,	, etc.)				
Water Column (WC) in W	esi [TD-DTW	117	.81	_			GALLONS PER FOOT (gpf)			
Gallons per foot (GPI	F); from char	īī).16	_			1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65			
Gallons in We	II [WC x GPF	īā	1.85	_= Weil C	asing Volum	ie (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47			
Evacuation Method	i and Materia	I Dispo	sable t	pailer	with	poly p	copylene cope			
							//			
			SAN	APLING DA	TA AND					
		<u>. </u>	FIE	LD PARAM	ETERS					
Color:		Odor:		heen			bidity: Dr. brown-black Stained Turbid			
Well Volumes	1 st	and.	3 rd	4m	5 th	final				
pH:	10.0	10,0	10.02			10.06				
Specific Conductance:	4150	4250	4220			4300				
Temperature:	14.5	14.5	14.5		<u> </u>	14.5				
		. 70.	. 11 1.	٠١.	.	1 .	- 1			
Sampling Method as	nd Material(s	i: Urspo				wiy pro	pylene rope			
				er Descript			Preservative			
Parameters to be Analys				b X or H			preserved by: Lab X or HMI			
Diss As, Be, Ma, No	, V		<u>500 m</u>	L Plas	tic		HNO3- field filtered Imicron			
(n-total, (n-amenable 250 ml					tic		NAOH			
Spec Cond, pH, F 250 mL					stic		4°C			
PCE 2×40mL Glas							HCL			
!										
		 `					Sec.			
Sampling F	ersonnei:	T/-	الماميي	<	Mounel	V.				
			1.		Menosl	,	1 (31			
	omments:						to filter; well almost			
;		-chy	atter 6	94/						
<u> </u>										



Page ____ of ____

Project Name: Ormet				_		Sam	pie ID: MW-19	
Project Number: HM003.0			-		Replicate ID:			
Site Location: Hannihal	Onio		·			Time	Sampling Began: 0915	
Sampling Date: _5/4/98	Sampling Date: 5/4/98 Weather: SUNNY					Time	Sampling Completed: 0940	
								
		_	EV	ACUATION	DATA			
Description of Measurin	g Point (MP	1 To	o of	PVC				
1	MP Elevation	า	1	Diamet	er of Well (Casing	3"	
Total Sounded Depth of Well Be	low MP (TD) 6	5.20	Gal	ions to be P	urged _	12	
Depth to Water Beio	w MP (DTW	1 4	1.78	(3 MC/	s, 5 WCVs	., etc.)		
Water Column (WC) in W	efi [TD-DTW	12	3.42	<u> </u>		Į.	GALLONS PER FOOT (gpf)	
Gallons per foot (GPF	; from char	tt	0.16	_			1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65	
Gallons in Wei	I (WC x GPF	73	3.75	_= Well Ca	sing Volum	e (WCV)	1%"=0.09 2%" = 0.26 3%" = 0.50 6" = 1.47	
Evacuation Method	and Materia	i Dispo	sable	pailer	with	poly po	opylene rope	
		- 1					//	
		i	SAN	MPLING DA	TA AND	Ì		
		L	FIE	LD PARAM	ETERS			
Color: Brown		Odor:				Turt	sidity: Turbid	
Well Volumes	151	and.	3 rd	4th	5Th	final	<u> </u>	
рН:	6.56	6.81	4.90	 		4.95		
Specific Conductance:	550	560	570		 	575		
Temperature:	12	12	12			12	<u> </u>	
		5.		•1			,	
Sampling Method an	d Material(s	i: <u>Dispo</u> :				sold brot		
				er Descript		• •	Preservative	
Parameters to be Analyz	ed			b <u>X</u> or H			preserved by: Lab X or HMI	
Diss As, Be, Ma, Na	Diss As, Be, Ma, Na, V 500 m						HNOZ- field filtered Imicron	
(n-total, (n-amenable 250 m					tic		NAOH	
				al Pla	stic	······································	4°C	
, ,							_	
		_						
Sampling Pe	ersonnel:	T (العطميين	<	Menosi	k.c		
	mments:	27	imphell	1 -	<u> 11)640)31</u>	7	•	
	mienta.							
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Project Name: Ormet				Sample ID: MW-28				
Project Number: HM003.0			_		Repl	icate ID:		
Site Location: Hannihal			_		Time	Sampling Began: 1037		
Sampling Date: 5/10/93	<u>. </u>	Weather: _	Rain	<u>50's</u>		Time	Sampling Completed: 1055-	
				- 				
,						 j		
		L	EV	ACUATION	DATA			
		. T	_	214				
Description of Measuring			p_ot_	rvc_			a"	
	MP Elevation					Casing		
Total Sounded Depth of Well Be			6.06		ions to be P	-	11.5	
Depth to Water Belo Water Column (WC) in W			2.26 3,80	_ 13 WCV	/s, 5 WCVs	. 5(0.)	GALLONS PER FOOT (gpf)	
Gallons per foot (GPF).16	_			1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65	
Gallons in Wel			.81	 = Well C:	asina Volum	ne (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47	
Canona at Wes						= [
Evacuation Method	and Materia	ai Disdo	sable 1	pailer	with	polv or	opylene rope	
						 	77	
ļ Į	•		SAI	MPLING DA	TA AND			
			FIE	LD PARAM	ETERS			
Color: Brown		Odor:	,		····		pidity: Very cloudy	
Well Volumes	155	and.	3rd	4th	5 Th	final		
pH:	5.25	5.30	5.30	<u></u>	 	5.32		
Specific Conductance:	550	560	540	ļ		550		
Temperature:	13.5	13.5	13.5	L	L	13.5	-	
Sampling Method an	d Materialle	: Dism	schle h	nilor .	uita -	nlu non	oulene vone	
Sampling Weblod an	· 1410764 161/9	0570.		er Descript	•	('' 	Preservative	
Parameters to be Analyz	ed			b <u>X</u> or H			preserved by: Lab X or HMI	
	_			L Plas			HAWZ - field filtered 1 micron	
							NAOH	
Cn-total, Cn-amenable 250 ml							4°C	
Spec Cond, pH, F			aso n	nl Pla	عاال		7.0	
								
								
		 .	, ,,					
Sampling Po	ersonnei:	JC	imphell	- 5	Menosi	ky		
Co	mments:		-			· 	· · · · · · · · · · · · · · · · · · ·	
								
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Project Name: Ormet				_		Sam	pie ID: MW-aC	15
Project Number: HM003.07						Repli	cate ID:	
Site Location: Hanniha						Time	Sampling Began:	0743
Sampling Date: 5/7/98 Weather: L+ Rain			60's		Time	Sampling Completed	d: 0810	
		<u> </u>	EV	ACUATION	DATA			
Description of Measur	ing Point (MP)	To	p of	PVC				
•	MP Elevation	1	<u></u>	_ Diamet	ter of Well (Casing	a"	
Total Sounded Depth of Well B	elow MP (TD)		1.35	Gai	lons to be F	Purged _		
. Depth to Water Belo	ow MP (DTW)		2.86	_ (3 MC/	/s, 5 WCVs	i, etc.)		
Water Column (WC) in V			0.49	_		[GALLONS	PER FOOT (gpf)
Gallons per foot (GP			0.16			- {	1 14" = 0.06 2" = 0.16	
Gallons in We	ell (WC x GPF	·	3.3	_= Well C	sing Volum	ne (WCV) [1 %" = 0.09 2%" = 0.26	5 3½" = 0.50 6" • 1.47
		. 5.		-1	٠,			
Evacuation Method	d and Materia	1 Dizba	sable i	bailer_	with	poly po	opyliene rope	
		<u></u>	SAI	MPLING DA	TA AND			
		i 1		LD PARAM				
		٠				'		
Color: 11 Lt Tan		Odor:		_		Turb	idity: V 51 C	loudy
Well Volumes	35	and	3rd	4th	5 Th	final		7
pH:	8.7	8.7	8.7			8.7		
Specific Conductance:	1625	1680	16.75			1665	<u> </u>	
Temperature:	14.5	14.5	14,5	<u> </u>	L	14.5	<u> </u>	
			11.	• 1			,	
Sampling Method a	nd Material(s)	: <u>Dispo</u>				sold beot	·	
The second of the fourth				er Descript		•		ervative
Parameters to be Analy				b X or HMI			_	Lab X or HMI
			L Plastic			HNO3- field filtered Imicron		
Cn-total, Cn-an				L Plas	_		NAOH	
Spec Cond, pH, F			250 n	ni Pla	stic		<u>4°C</u>	
						 .		
·								
					·			
Sampling F	Personnei:	Ja	umphell		Menosi	ky		
C _l	omments:		· · · · · · · · · · · · · · · · · · ·	<u> </u>		<i>'</i>		
							····	



10007-07/WS-LOQ.WICZ

Page of
Sample ID: MW-29d Replicate ID: Time Sampling Began: 0710
Time Sampling Completed: () 740
a"
20
GALLONS PER FOOT (gpf)
1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.85
CV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
y propylene rope
Turbidity: Clear
14
53
4.5
1

Project Name: Ormet						Sam	ole ID: MW-2	9d
Project Number: HM003.0	37			-		Repi	cate ID:	
Site Location: Hanniha	1, Ohio			_		Time	Sampling Began:	0710
Sampling Date: 5/7/9	<u> </u>	Weather:	t Rain	6015		Time	Sampling Complete	d: <u>1740</u>
		_	EAY	ACUATION	DATA			
Description of Measur	ina Point (MP	1 To	o of	PVC_				
Desa.p. (37, 51, 111, 111, 111, 111, 111, 111, 111	MP Elevation		D01		er of Well (Casing	a"	
Total Sounded Depth of Well B	elow MP (TD	18	1.98	Gall	ons to be F	Purged _	20	····
Depth to Water Bei	ow MP (DTW	n <u>4</u> 0	0,47	_ (3 WC/	s, 5 WCVs	, etc.)	·	
Water Column (WC) in V	Vell [TD-DTW	1 4	1.57			ļ	GALLONS	PER FOOT (gpf)
Gallons per foot (GF	F); from char	t	0.16				1%" = 0.06 2" = 0.1	6 3" = 0.37 4" = 0.65
Gallons in We	ii [WC x GPF	ī[.165	_= Well Ca	ising Volum	ne (WCV)	1%" = 0.09 2%" = 0.2	6 3%" = 0.50 6" = 1.47
					_			
Evacuation Metho	d and Materia	" Dispo	sable	bailer	with	poly pr	opylene rope	
	•	-	541	MPLING DA	TA AND			
		***		LD PARAM		ļ		
		<u>i</u>		LD PARAIN	e i eno			
Color: None		Odor:				Turt	oidity: Clear	
Well Volumes	151	and.	300	4 Th	5th	final	· ·	
pH:	7.39	7.50	7.5n			7.53		
Specific Conductance:	565	505	560			540		
Temperature:	14.5	14.5	14,5	<u> </u>	L	14.5		
Sampling Method a	nd Material(s	: Dispo	schle h	riler i	with i	Shinoi	oulene rope	
				ner Descript	,	77	<u>.</u>	ervative
Parameters to be Analy	zed		From La	nb_X_orH	МІ		preserved by:	Lab X or HMI
			L Plas				iltered Imicron	
Cn-total Cn-amenable 250 ml						NAOH		
Spec Cond, pH, F				nL Pla			4°C	
		~ .	1 11			l		
Sampling I		عاله	imphell	-1-5	Menosi	<u>Ky</u>		
9	omments:							
ł								
	 			·		·		



Page _	of .	

Project Name: Ormet				_		Sam	ple ID: MW-30
Project Number: HM003.07						Repl	icate ID:
Site Location: Hannihal	Ohio	······································				Time	Sampling Began: 0835
Sampling Date:		Weather:	foggy 5	<u>05</u>		Time	e Sampling Completed: 0915
Description of Measurin	ag Point (MP) To	<u> </u>	ACUATION PUC	DATA		
	MP Elevation		7	Diamet	er of Well C	asing	3"
Total Sounded Depth of Well Be	low MP (TD) (0.41	 Gail	ons to be P	urged .	
Depth to Water Belo			19.52	(3 WCV	s, 5 WCVs,	, etc.)	
Water Column (WC) in W			0.89			{	GALLONS PER FOOT (gpf)
Gallons per foot (GPF).16	_		Ī	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Wel	I [WC × GPF	7	1.75	_= Well Ca	sing Volum	e (WCV)	1 1/1 = 0.09 2 1/1 = 0.26 3 1/1 = 0.50 6" = 1.47
Evacuation Method	and Materia	n Dispo	SAI	MPLING DA	TA AND	poly px	opylene rope
		<u>-</u>				'	
Color: Brown		Odor:				Turt	sidity: Forbid V Cloudy
Well Volumes	155	2 40	3rd	4th	5th	final	1
pH:	5.48	5.42	5.45			5.70	
Specific Conductance:	400	410	416			418	
Temperature:	14	14	14	<u> </u>		14	<u> </u>
Sampling Method an	id Material(s): <u>Dispo</u>	seble b	ziler i	with c	plypro	pylene rope
·		,		ner Descript		. //	Preservative
Parameters to be Analyz	ed		From La	ab <u>X</u> or H	MI		preserved by: Lab X or HMI
Diss As, Be, Ma, No, V 500 ML			L Plas	Plastic		Hwoz- field filtered Imicron	
			L Plas	L Plastic		NAOH	
			nl Pla	L Plastic		4°C	
PCE 2×40mL GI			Glass HCL		HCL		
	Sampling Personnel: J (amphell, 5 Menosky Comments:						
1							



19407-071WS-LDG.WE3

WATER SAMPLING LOG

Page ____ of ____

Project Name: Ormet				_		Sam	ple ID: MW-31
Project Number: HM003.0	7			_		<u>Repi</u>	icate ID:
Site Location: Hannihal	onio			_		Time	Sampling Began: 1020
Sampling Date: 5/6/93	<u>*</u> '	Weather: _	Servey 60	213		<u>Time</u>	Sampling Completed: 1046
Description of Measuring Total Sounded Depth of Well Be Depth to Water Below Water Column (WC) in W Gallons per foot (GPF)	MP Elevation of the MP (TD w MP (DTW ell (TD-DTW charm); from charm)	1 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	P of 17.51 17.68 9.83 0.16	Gall (3 WCV 	er of Well C ons to be P 's, 5 WCVs,	urged , etc.)	GALLONS PER FOOT (gpf) 1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method	and Materia	al Dispo		MPLING DA		poly p	opylone rope
				LD PARAMI			
	•	<u></u>					
Color: Dark brown - b	lack (col	a) Odor:				Turt	pidity: Stained + Turbid
Well Volumes	151	and	300	4m	5 Th	final	
pH:	9.55	9.74	9.76			9.80	
Specific Conductance:	2340	2340	2320			2350	
Temperature:	15	14.5	14.5	<u> </u>		14.5	
Sampling Method ar Parameters to be Analyz		1: <u>Dispo</u>	Contain	er Descript	ion	oly pro	Preservative preserved by: Lab X or HMI
				L Plas			HNO3- field filtered Imicron
Diss As, Be, Mn, Nc, V 500 ml Cn-total, Cn-amenable 250 ml						NAOH	
						4°C	
PCE PCE							HCL
Sampling P	ersonnel: omments:		umphell v does	1 1.		ky	



Page ____ of ____ $m\omega$ -32 Sample ID:

Project Name: Ormet						Sar	noie ID:	mw-32
Project Number: HM003.0	7					Reg	olicate ID:	$m\omega$ -32d
Site Location: Hannihal	Ohio		·			Tin	ne Samplin	ng Began: / 4/30
Sampling Date: <u>5/4/98</u>	•	Veather:	Sunny	70'5		Tin	ne Samplin	ng Completed: 1500
Description of Measurin Total Sounded Depth of Well Be Depth to Water Below Water Column (WC) in Well Gallons per foot (GPF Gallons in Well Evacuation Method	MP Elevation low MP (TD) w MP (DTW) ell (TD-DTW) 1; from chart I (WC x GPF)	57 40 16	2.18 .68 .50 1.16 1.64	Gai (3 WC\ _ = Well C	ter of Well (lons to be F /s, 5 WCVs asing Volum	Purged ., etc.] ne (WCV)	,	GALLONS PER FOOT (gpf) 6 2" = 0.16 3" = 0.37 4" = 0.65 9 2%" = 0.26 3%" = 0.50 6" = 1.47
				LD PARAM				
Color: Durk brown-bl Well Volumes	ack 1 st	Odor:	32	4 th	5 Th	Tui final	rbidity:	Stained
pH:	8.00	8.10	8.10		 	8.10		
Specific Conductance:	686	692	692	ļ	 	697		
Temperature:	15	15	15	<u> </u>	<u> </u>	15		
Sampling Method and Parameters to be Analyz		: <u>Dispos</u>	Contair From La	ner Descript ib <u>X</u> or H	ion ' IMI	<u>ply pro</u>	pre	Preservative served by: Lab X or HMI
Diss As, Be, Mn, Na	,		500 m	L Plas	tic		HNO3-	field filtered Imicron
Cn-total Cn-am	enable		250 m	L Plas	tic		NAOL	4
Spec Cond, pH, F			250 n	nL Pla	stic		<u>4°C</u>	
Sampling Pe	ersonnel: minents:	J (a Color	mphell F, Iter	, S ed out	Menosl , used	ky 2 ndfi	Here	with dup



Page ____ of ____

Sample ID: MW-345

Project Name: Ormet	Sample ID: MW-345
Project Number: HM003.07	Replicate ID:
Site Location: Hannihal, Ohio	Time Sampling Began: 0930
Sampling Date: 5/7/98 Weather: Overcest	60'5 Time Sampling Completed:
EVA	ACUATION DATA
Description of Measuring Point (MP) Top of	PVC
MP Elevation	Diameter of Well Casing 2"
Total Sounded Depth of Well Below MP (TD) 49.35	Gallons to be Purged
Depth to Water Below MP (DTW) 37.12	(3 WCVs, 5 WCVs, etc.)
Water Column (WC) in Well [TD-DTW] 12,23	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chart 0.16	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.69
Gallons in Well [WC x GPF] 1,96	= Well Casing Volume (WCV) 1%" = 0.09 2%" = 025 3%" = 0.50 6" - 1/47
Evacuation Method and Material Disposable	pailer with poly propylene tope
SAN	APLING DATA AND
FIE	D PARAMETERS
Color: Odor:	Turbidity:
Well Volumes 1st 2nd 3rd	4 th 5 th final
pH:	
Specific Conductance:	
Temperature:	
Sampling Method and Materials: Dispassible b	aller with polypopulars who
	er Description Preservative
	b X or HMI preserved by: Lab X or HMI
Diss As, Be, Man Na, V 500 mi	
Cn-total, En-amerable 250m	
Spec Cond, pH, F 250 m	L Plastic XX
Sampling Personnel: Thamphell	8 menosky
Comments:	
1	
######################################	



Page of
nω-34d
egan: 0900 completed: 0928
ALLONS PER FOOT (gpf)
2" = 0.16 3" = 0.37 4" = 0.65 2%" = 0.26 3%" = 0.50 6" = 1.47
поре

Project Name: Ormet				_		Sam	ple ID: Mu	J-34d
Project Number: HM003.07						Repi	icate ID:	
Site Location: Hannihal, Ohio			_		Time	Sampling Bega	n: 0900	
Sampling Date: 5/7/98 Weather: Overcust				60's		Time	Sampling Com	pleted: 09J9
Description of Measuring Total Sounded Depth of Well Beautiful Depth to Water Below Water Column (WC) in Water Column (WC) in Water Column (WC) in Water Column (WC) in Well Column (WC) i	MP Elevation MP (TD w MP (DTW ell [TD-DTW char char I [WC x GPF	1	p of 3.24 3.07 2.17 2.16 5.15 sable	Gail (3 WCV Well Ca	er of Well (ons to be fis, 5 WCVs) using Volume	Purged i, etc.)	1 %" = 0.06 2" 1 %" = 0.09 2%"	ONS PER FOOT (gpf) = 0.16 3" = 0.37 4" = = 0.26 3%" = 0.50 6" =
l Calana R		Odon				Tuet	oidity: V Cla	بالمد
Color: Brown	,51	2 wd .	3rd	4 th	5 Th	final	Tidity. V Co	ody
Well Volumes pH:	7.11	7.2	7.23	1-7	<u> </u>	7,23	 	. ,
Specific Conductance:	600	590	600			595		
Temperature:	13.5	13.5	13.5			13.5		
Parameters to be Analyzed From Lab Diss As, Be, Ma, Na, V .500 ml Cn-total, Cn-amenable 250 ml				ner Description Description L Plassible Plassi	on		preserved	Preservative by: Lab X or HMI I filtered I micr
Sampling Po	ersonnel: mments:	J (c	imphell	, .5	Menosi	<u>ky</u>		



Page	αf	
rage	 O1	

Project Name: Ormet				_		Sar	mple ID: $M\omega$ – 3.5
Project Number: HM003.0			_		Reg	olicate ID:	
Site Location: Hannihal, Ohio						Tim	ne Sampling Began: 1,515
Sampling Date: 5/4/98 Weather: Sunky						<u>Tin</u>	ne Sampling Completed: 1545
· · · · · · · · · · · · · · · · · · ·							
		·	·		<u>.,</u>		
		1	EVA	ACUATION	DATA		
Description of Measuring	ng Point (MF	" <u>To</u>	p of	PUC			
	MP Elevation	n	† —————	Diamet	er of Well C	asing	a"
Total Sounded Depth of Well Be	How MP (TE) 4	4.70	Gall	ons to be P	urged	. 5
Depth to Water Belo	w MP (DTV)	n3	6.62	(3 WCV	s, 5 WCVs	, etc.)	
Water Column (WC) in W	eii [TD-DTW	n	0.08				GALLONS PER FOOT (gpf)
Gallons per foot (GPF	7; from char	rt(2.16				1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Wel	I [WC x GP!	7	.62	_= Well Ca	sing Volum	e (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method	and Materia	ai Dispo	sable	bailer	with	poly p	ropylene rope
		· -				, , , , ———	<i>,,</i>
		1	SAN	MPLING DA	TA AND		
			FIE	LD PARAM	ETERS		
Color: L+ Brown-blac	<u>k</u>	Odor:			· -		rbidity: Stained
Well Volumes	155	and	3 rd	4 th	5 Th	final	
pH:	8,40	8.90	8.92			9.10	
Specific Conductance:	575	645	650	 		766	-
Temperature:	15	15	15	<u> </u>		15	
		. D'	ما داما د	. 14.	. 4		- 1
Sampling Method an	d Materiai(S	ii: Uispo				bly pro	•
B				er Descript			Preservative preserved by: Lab X or HMI
Parameters to be Analyz				ib <u>X</u> or H			
Diss As, Be, Mn, Na	•						HNO3- field filtered Imicron
Cn-total, Cn-am	enable			L Plas			NAOH
Spec Cond, pH, F 250 ml					stic		4°C
							
1		_					
		_					
Sampling Pe	ersonnel:	J (umphell	.5	Menos	VV	
	mments:	Δ Η.	30 01	1	111	7 1	y color does not filter
		-Frank	- m year	www.w	II avm	and the	The core was fully
1		-OUA-					-



Page ____ of ____

Project Name: Ormet	Sample ID: MW-36
Project Number: Hm003.07	Replicate ID:
Site Location: Hannihal, Ohio	Time Sampling Began:
Sampling Date: 5/ 198 Weather:	Time Sampling Completed:
	-
EVACUATION DATA	
Description of Measuring Point (MP) Top of PVC	
MP Elevation Diameter of Well Casin	g _ 2"
Total Sounded Depth of Well Below MP (TD) 52.08 Gallons to be Purge	d/
Depth to Water Below MP (DTW) (3 WCVs, 5 WCVs, etc.	
Water Column (WC) in Well [TD-DTW]	GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from chartO./6	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Well [WC x GPF] = Well Casing Volume (W	/CV) 1½"=0.09 2½"=0.25 3½"=0.50 6"=1.47
	. / /
Evacuation Method and Material Disposable barker with po	ly propylene cope/
	_/ /
SAMPLING DATA AND	1
FIELD PARAMETERS	
Coder Coder	Turbidity:
Color: Well Volumes 1st 2nd 3rd 4th 5th fi	nal /
Well Volumes 131 2 3 4 1 5 m +i	74(
Specific Conductance:	
Temperature:	
Sampling Method and Material(s): Disposable bayler with poly	propylene rope
Container Description	Preservative
Parameters to be Analyzed From Lab X or HMI	preserved by: Lab X or HMI
Diss As, Be, Mn, No. Soome Plastic	HOO3 - field filtered Imicron
(n-total (n amenable 25 ml Plastic	NAOH
Spec Concl. 2H. F 250 ml Plastic	<u> 4°C</u>
Sampling Personnel: J Campbell, 5 Menosky	
Comments:	
1	



Page of
mω-37
Began: 1400 Completed: 1420
GALLONS PER FOOT (gpf)
2" = 0.16 3" = 0.37 4" = 0.65
2%" = 0.26 3%" = 0.50 6" = 1.47
rope

Project Name: Ormet				_		Samo	ile ID: MW-37		
Project Number: HM003.07						Replie	ate ID:		
Site Location: Hannihal, Ohio			_		Time	Sampling Began: 1400			
Sampling Date: <u>5/4/9</u>	<u>. </u>	Weather:	Sunny	1 700		Time	Sampling Completed: 1420		
. ,									
Description of Measurin Total Sounded Depth of Well Be Depth to Water Belo Water Column (WC) in W Gallons per foot (GPF	MP Elevation flow MP (TD w MP (DTW ell (TD-DTW	3 3 3 10 10 10 10 10 10 10 10 10 10 10 10 10	p of 6.98 0.87	Gall	DATA er of Well (lons to be F	Purged	GALLONS PER FOOT (gpf) 2" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65		
Gallons in We	I IWC x GPF	7	2.6	_= Well Ca	asing Volum	ne (WCV)	%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47		
Evacuation Method	and Materia		SAI	MPLING DA	TA AND				
Color: Brown	,5T	Odor:		4th	5 Th	Turbi	dity: Turbid + Stained		
Well Volumes	8.20	1	3rd	9	3	final			
pH:		8.26	8.33	 	 	8.30 505			
Specific Conductance: Temperature:	507 14	510	510			14			
Sampling Method an	L	 	sable b	CILCY L			y tene rope Preservative		
Parameters to be Analyz	ed		From La	ab <u>X</u> or H	MI		preserved by: Lab X or HMI		
Diss As, Be, Ma, Na	, V		.500 m	L Plas	fic		HNO3- field filtered Imicron		
Cn-total, Cn-am	*		250 m	L Plas	Plastic NAOH				
Spec Cond, pH, F			250 n		stic		4°C		
Sampling P	ersonnei: mments:	J (c	umphell	, s	Menosi L'Hev	ky	hard to filter		
•					7.1.6.5.	,,,,			



Environmental Consultin	Services		WATER	R SAMP	LING LC	OG		Page of
Braines Names Assessed						Sam	ple ID:	mw-39 s
Project Name: Ormet		· · · · · · · · · · · · · · · · · · ·		_			icate ID:	
Project Number: HM003.0				_			Sampling	Began: 1605
Site Location: Hannihal Sampling Date: 5/5/19	,	Weather /	Duevoast	_ (^°				Completed: 1625
Sampling Date: $5/5/99$	2	. reallier. C	225,002					
•				ACUATION	DATA			
Description of Measuring	ng Point (MF	10	p of	PVC			- JI	
	MP Elevation	n		Diamet	er of Well C	Casing	<u>a"</u>	
Total Sounded Depth of Well Be	HOW MP (TE	1_6	2.23	Gall	ons to be P	urged	9	
. Depth to Water Belo	w MP (DTW		1.68	(3 MCA	s, 5 WCVs	, etc.)		
Water Column (WC) in W	eii (TD-DTW	7	4.55			ļ		GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from char	٠	0.16	_			1 %" = 0.06	2" = 0.16 3" = 0.37 4" = 0.65
Gallons in We	I [WC x GPF	7	3	_= Well Ca	sing Volum	ie (WCV)	1 1/2" = 0.09	2½" = 0.26 3½" = 0.50 6" = 1.47
Color: L+ Brown		Odor:		MPLING DA		Turk	oidity: c	5tained
Well Volumes	,51	and	370	4 Th	5Th	final		3741664
pH:	9.02	9.09	9.09	 '	<u> </u>	9,09	1	
Specific Conductance:	4.100	4,060	4050			4000	1-	
Temperature:	14.5	14.5	14.5			14.5	1	
Parameters to be Analyzed Diss As, Be, Mn, Na, V Cn-total, Cn-amenable Spec Cond, pH, F			Contair From La .500 m .250 m	ner Description L. Plastin L. Pla	MI		pres	Preservative served by: Lab X or HMI field filtered Imicron
Sampling P	ersonnel: mments:		emphell	1.		1		



Environmental Consulting	Services		WATER	R SAMPI	LING LO	oG			Page of
Project Name: Ormet_				_		Sam	ole ID:	mω-3°	9d
Project Number: HM003.0	7			_		Rep	icate ID:	 	·
Site Location: Hannihal	•			_		Time	e Sampling	Began: /	525
Sampling Date: 5/5/91	•	Weather: <u>C</u>	vercust	60		Time	s Sampling	Completed:	1600
. ,									
•			EV	ACUATION	DATA				
Description of Measuring	ng Point (MP	7 <u>To</u>	p of	PVC					
	MP Elevation	n	, ,	_ Diamet	er of Well C		a"		· · · · · · · · · · · · · · · · · · ·
Total Sounded Depth of Well Be	low MP (TD		0.21_	_ Gall	ons to be P	urged	19	·	
Depth to Water Belo	w MP (DTW		1.35	_ (3 MCA	s, 5 WCVs	, etc.)			
Water Column (WC) in W	eii [TD-DTW		8,86			·		SALLONS P	ER FOOT (gpf)
Gallons per foot (GPF	; from char		2.16	_			1%" = 0.06		3" = 0.37 4" = 0.65
Gallons in Wei	I [WC x GPF	T	1,22	_= Well Ca	ising Volum	ie (WCV)	1%" = 0.09	2%" = 0.26	3%" = 0.50 6" = 1.47
Evacuation Method	and Materia	al Dispo		ogiler MPLING DA' LD PARAMI	GMA AT	poly p	opylene	rope	
		. .		_				<i>(</i>	zı 1.
Color: L+ Brown	,55	a not	3rd	4m	5Th	final	pianty: 31	Cloudy -	Cloudy
Well Volumes	7.20	7.30	7.35	7		7.35	 -		
pH: Specific Conductance:	560	540	560			560	 	·	
Temperature:	14	14	14			14	1		
					I—————	. 			
Sampling Method an	d Material(s	1: <u>Dispo</u>	seble b	ailer u	with p	plypro	pylene	rope	
		•	_	er Descripti		. 16		Preser	vative
Parameters to be Analyz	ed		From La	b X or H	MI		pres	erved by: L	ab 🔀 or HMI
Diss As, Be, Ma, No	, V		500 m	L Plast	ic		HNO3-	field fil	tered Imicron
Cn-total, Cn-am	enable		250 m	L Plas	lic	<u>-</u> -	NAOH		
Spec Cond, pH, F			250 n	L Plas	stic		4°C		
							•		
:									

J Campbell, S Menosky Sampling Personnel: Comments:



Page of
MW-405
Segan: 1355 Completed: 1415
ALLONS PER FOOT (gpf)
2" = 0.18 3" = 0.37 4" = 0.65 2%" = 0.26 3%" = 0.50 6" = 1.47
rope
1 Cloudy

Project Name: Ormet				_		San	noie ID:	mw-40	25	
Project Number: HM003.0	7			_		Rep	licate ID:			
Site Location: Hannihal	Ohio			-		Tim	e Sampling	Began: /	1355	
Sampling Date: <u>5/,5/98</u>	١ ١	Weather:	Light K	Pain 60°		Tim	e Sampling	Completed:	1415	
Description of Measuring Total Sounded Depth of Well Be Depth to Water Below Water Column (WC) in Worder Gallons per foot (GPF) Gallons in Well Evacuation Method	MP Elevation slow MP (TD w MP (DTW ell [TD-DTW); from char I [WC x GPF		p of 20.40 2.93 7.47 2.16	Gail (3 WCV _= Well Ca	er of Well Cons to be Poss, 5 WCVs.	urged , etc.) e (WCV)	1½" = 0.06 1½" = 0.09	2" = 0.16 2%" = 0.26	ER FOOT (gpf 3" = 0.37 4 3%" = 0.50 (0.65
		- - 013 2	SAI	MPLING DA	TA AND		Y).	<u> </u>		
Color: Lt Brown		Odor:					bidity:	'SI Cloud	Jy	
Well Volumes	151	and.	3rd	4th	5 Th	final	<u> </u>		<i>-</i>	
pH:	8,14	8.16	8.17	ļ		8.18				
Specific Conductance:	1288	1330	1330	ļ		1335				
Temperature:	14.5	14.5	14,5	<u> </u>		14.5				
Parameters to be Analyzed Diss As, Be, Mn, Nc, V Cn-total, Cn-amenable Spec Cond, pH, F			Disposable bailer with polypriconatiner Description From Lab X or HMI 500 ML Plastic 250 ML Plastic 250 ML Plastic					Preser erved by: Li	vative ab <u>X</u> or HN Hered / m	
Sampling Pe Co	ersonnel: mments:	J (e	imphe//	, .5	Menosl	<u></u>				



Project Name: Ormet

		Page of	
Sample ID:	mw-c	10d	
Replicate ID:			
Time Complies	. Pomone	1318	

Project Number: HM003.0	<i>ֈ</i>			_		uen	licate ID:
Site Location: Hannihal			_		Tim	e Sampling Began: 1318	
Sampling Date: <u>5/5/98</u>		Weather: _L	ight Rai	n 55-	60°	Tim	e Sampling Completed: 1350
			EVA	CUATION	DATA		
Description of Measuring M Total Sounded Depth of Well Bel Depth to Water Belov	MP Sevation low MP (TD	n1 n52	1,75	— Gall	er of Well Cons to be P	urged	2" . 18.5
Water Column (WC) in We Gallons per foot (GPF) Gallons in Well	; from char	t	7.65 1.16 1.02	 = Well Ca	sing Volum	e (WCV)	GALLONS PER FOOT (gpf) 1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method	and Materia	ai Dispo:	SAN	APLING DA	TA AND	poly p	copylene rope
		<u>}</u>	FIE	LD PARAM	EIEND		
Color: None		Odor:				-	bidity: Clear
Well Volumes	131	and.	3 rd	4th	5 Th	final	
pH:	7.50	7,68	7.70			7.73	
Specific Conductance:	1250	1255	1255			1250	
Temperature:	14.5	14.5	14.5		<u></u>	145	
Sampling Method and	d Material(s	i: <u>Dispos</u>	0	er Descript		sy pro	pylene rope Preservative
Parameters to be Analyze	ed		From La	b <u>X</u> or H	MI		preserved by: Lab X or HMI
Diss As, Be, Mn, Na,	<u> </u>		.500 m	L Plas	lic		HWO3- field filtered Imicron
Cn-total Cn-ame			250 m	L Plas	tic		NAOH
Spec Cond, pH, F			250 m	nL Pla	stic		<u>4°C</u>
Sampling Pe	ersonnel: mments:	J (0	mphe11	, S	Menosi	ky	



Page of
Sample ID: MW-41
Replicate ID:
Time Sampling Began: 1310
Time Sampling Completed: 1345

Project Name: Ormet						Sam	noie ID: Mu)-41
Project Number: HM003.0	7					Rep	licate ID:
Site Location: Hannibal	Ohio			_			e Sampling Began: /3/0
Sampling Date: 5/4/98	ž	Weather: _	Sunny	700		Tim	e Sampling Completed: 1345
							
		<u>. </u>	EV	ACUATION	DATA		
			C	D			
Description of Measuring			p ot	PVC			a"
	MP Elevation		2.24		er of Well (-	a
Total Sounded Depth of Well Be			2.26 ea		ons to be P 's, 5 WCVs	,	. 87
Depth to Water Belo			.99 1.27	(3 WCV	'S, 3 WCVS	, etc.,	GALLONS PER FOOT (gpf)
Water Column (WC) in W Gallons per foot (GPF			2.16	-			1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Wel			7,9	— = Well Ca	sing Volum	ne (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
22	·				-		
Evacuation Method	and Materia	al Dispo	sable 1	bailer	with	poly p	ropylene rope
	-		·				17
ì [į	SAI	MPLING DA	TA AND		
		<u> </u>	FIE	LD PARAM	ETERS		
Color: Brown	, sT	Odor:	1 - 2	4 m	5Th		bidity: Cloudy
Well Volumes		and.	3rd	4.4	3	final	
pH:	6.53 435	6.70	447	}		449	
Specific Conductance:	14	14	14	 		14	
Temperature:	<u></u>	1 1	1_1_				
Sampling Method an	d Material(s): <u>Dispo</u> :	sable b	ailer i	uith i	plypro	pylene rope
		,		ner Descripti		. //	Preservative
Parameters to be Analyz	ed		From La	ıb <u>X</u> or H	Mi		preserved by: Lab X or HMI
Diss As, Be, Mn, Na	, V		_500 m	L Plas	lic		HNO3- field filtered Imicron
Cn-total Cn-am	-		250 m	L Plas	Plastic NAOH		
Spec Cond, pH, F			250 n	nL Pla	stic		_4°C
1							
				······			
Sampling Po	ersonnei:	J (imphell	5	Menns	kv	
	mments:				1710.32.2.	/	· · · · · · · · · · · · · · · · · · ·
				····		·	
1				 ,			



= Environmental Consultin	g Services		WATER	RSAMP	LING LO	og	Page of
Project Name: Ormet						San	noie ID: MW-425
Project Number: HM003.0	 \7					Rep	licate ID:
Site Location: Hanniha				_		Tim	e Sampling Began: 🙉 1428
Sampling Date: 5/6/19	•	Weather: _	Sunny	70°		<u>Tim</u>	e Sampling Completed: 1440
		Г		ACUATION	DATA		
		<u>.</u>	EV	ACUATION	UATA		
Description of Measuri	ng Point (MP	To	p of	PVC			·
	MP Elevation	n	1	Diamet	er of Well (Casing	a "
Total Sounded Depth of Well B	elow MP (TD	1_5	2.30	Gall	lons to be F	Purged	······································
Depth to Water Belo	W MP (DTW	n <u>40</u>	.74	(3 WC/	/s, 5 WCVs	, etc.)	
Water Column (WC) in W	/eii [TD-DTW	n	.56				GALLONS PER FOOT (gpf)
Gallons per foot (GP	F); from char	^t	0.16				11/4" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in We	II (WC x GPF	7	1.85	_= Well Ca	sing Volum	ne (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method	i and Materia	a Dispo	SAI	bailer MPLING DA ELD PARAM	TA AND	poly p	opylene cope
color: Lt Brown		Odor:	·	· , ···	····	Turi	pidity: 31 (budy
Well Volumes	IST	and	3rd	4 th	5 Th	final	1
pH:	8.48	8.47	8.46			8.46	
Specific Conductance:	1410	1445	1455			1460	
Temperature:	15.5	15.5	15.5	<u> </u>	!	15.5	<u> </u>
Sampling Method at	nd Material(s	n: <u>Dispo</u>	sable b	ziler i	with F	ply pro	pylene rope
		•		ner Descript		. // '	Preservative
Parameters to be Analys	zed		From La	ub <u>X</u> or H	WI		preserved by: Lab X or HMI
Diss As, Be, Ma, No	, V		500 m	L Plast	lic		HW3- field filtered Imicron
Cn-total Cn-am	enable		250 m	L Plas	tic		NAOH
Spec Cond, pH, F		 _	250 n	nl Pla	stic		4°C
		_					
		-					
	- y						

J Campbell, S Menosky Sampling Personnel:



Environmental Consultin	eg Services		WATE	R SAMP	LING LO	DG	Page of
Project Name: Ormet				_		Sam	iole 10: MW-42d
Project Number: HM003.0)7			_		Rep	licate ID:
Site Location: Hanniha				_		Time	e Sampling Began: 1332
Sampling Date: 5/6/9	,	Weather: _	Sonny 7	00		Time	e Sampling Completed: 1415
*			EV	ACUATION	DATA		
Description of Measuri	ng Point (MP	7 <u>To</u>	p of	PVC			
	MP Elevation	n	!	Diamet	er of Well (Casing	a"
Total Sounded Depth of Well B	elow MP (TD) <u>8</u>	5.10	Gall	lons to be F	urged	
Depth to Water Belo	w MP (DTW	n <u>4</u> 0	0.61	(3 WC/	s, 5 WCVs	, etc.)	
Water Column (WC) in W	/eil [TD-DTW	n <u>4</u>	4.49	_			GALLONS PER FOOT (gpf)
Gallons per foot (GP	F); from char	t	0.16	_			1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in We	II (WC x GPF	₹	7.12	_= Well Ca	sing Volun	ne (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method			SAI	MPLING DA	TA AND	——————————————————————————————————————	Урукта ТБР
Color: None		Odor:		1		T	pidity: Clear
Well Volumes	151	and	3rd	4 Th	5th	final	
pH:	7.6	7.62	7.64	 	· · · · · · · · · · · · · · · · · · ·	7.64	
Specific Conductance:	540	540	535	 		5.35	
Temperature:	16.5	16	16	<u> </u>	L	1/4	
Sampling Method ar	nd Material(s	i: Dispo		Eiler u		ply pro	pylene rope Preservative
Parameters to be Analys	zed		•	ib X or H	·		preserved by: Lab X or HMI
Diss As, Be, Mn, No	, V		.500 m	L Plas	lic		HNO3- field filtered Imicron
Cn-total, Cn-am	enable		250 m	L Plas	tic		NAOH
Spec Cond, pH, F		· <u>-</u>	250 n	nL Pla	stic		4°C
:							
					,		

I (amphell, 5 Menosky

Sampling Personnel:

APPENDIX A-3

WATER SAMPLING LOG FORMS FOR AUGUST/SEPTEMBER 1998 MONITORING EVENT



Page ____ of ____

Project Name: Ormet Project Number: Hmo3.08 Site Location: Hgnnihal, Ohio Sampling Date: 9/1/98 Weather: SUNNY 65° EVACUATION DATA Description of Measuring Point (MP) MP Elevation Top of PVC MP Elevation Diameter of Well Casing Depth to Water Below MP (DTW) Depth to Water Below MP (DTW) Water Column (WC) in Well [ID-DTW] Gallons per foot (GPF); from chart Gallons in Well [WC x GPF] Evacuation Method and Material Disposable bailer with poly propulate COP
Site Location: Hannibal, Ohio Sampling Date: 9/1/98 Weather: SUNNY 65° Time Sampling Began: 8:10 Time Sampling Began: 8:45 EVACUATION DATA Description of Measuring Point (MP) MP Elevation Diameter of Well Casing Depth to Water Below MP (TD) Depth to Water Below MP (DTW) Depth to Water Below MP (DTW) Water Column (WC) in Well [TD-DTW] Gallons per foot (GPF); from chart Gallons in Well [WC x GPF] Well Casing Volume (WCV) Time Sampling Began: 8:10 Time Sampling B
Description of Measuring Point (MP) MP Elevation Top of PVC MP Elevation Diameter of Well Casing Depth of Well Below MP (TD) Depth to Water Below MP (DTW) Water Column (WC) in Well (TD-DTW) Gallons per foot (GPF); from chart Gallons in Well (WC x GPF) Weather: SUNNY 65° Time Sampling Comoleted: 8:45 EVACUATION DATA Diameter of Well Casing (3" 13.36 GALLONS PER FOOT (gpf) 1x' = 0.05 2" = 0.16 3" = 0.37 4" = 0.65 1x' = 0.05 2" = 0.16 3" = 0.37 4" = 0.65
Description of Measuring Point (MP) MP Elevation Top of PVC MP Elevation Diameter of Well Casing Gallons to be Purged Depth to Water Below MP (DTW) Water Column (WC) in Well (TD-DTW) Gallons per foot (GPF); from chart Gallons in Well (WC x GPF) Gallons in Well (WC x GPF) EVACUATION DATA Diameter of Well Casing Gallons to be Purged 13.36 GALLONS PER FOOT (gpf) 1x* = 0.06 2* = 0.16 3* = 0.37 4* = 0.55 1x* = 0.09 2x* = 0.25 3x* = 0.50 5* = 1.47
Description of Measuring Point (MP) MP Elevation Diameter of Well Casing 3" Total Sounded Depth of Well Below MP (TD) Depth to Water Below MP (DTW) Water Column (WC) in Well [TD-DTW] Gallons per foot (GPF); from chart Gallons in Well [WC x GPF] Well Casing Volume (WCV) Total Sounded Depth of Well Below MP (TD) Solutions to be Purged 13.36 Gallons to be Purged 13.36 GALLONS PER FOOT (gpf) 1x-20.05 2-20.16 3-20.37 4-20.85 Well Casing Volume (WCV) 1x-20.09 2x-20.25 3x-20.50 5-21.47
Description of Measuring Point (MP) MP Elevation Diameter of Well Casing 3" Total Sounded Depth of Well Below MP (TD) Depth to Water Below MP (DTW) Water Column (WC) in Well [TD-DTW] Gallons per foot (GPF); from chart Gallons in Well [WC x GPF] Well Casing Volume (WCV) Total Sounded Depth of Well Below MP (TD) Solutions to be Purged 13.36 Gallons to be Purged 13.36 GALLONS PER FOOT (gpf) 1x-20.05 2-20.16 3-20.37 4-20.85 Well Casing Volume (WCV) 1x-20.09 2x-20.25 3x-20.50 5-21.47
Diameter of Well Casing 3"
Diameter of Well Casing 3"
Total Sounded Depth of Well Below MP (TD)
Depth to Water Below MP (DTW) 57.39 (3 WCVs, 5 WCVs, etc.) Water Column (WC) in Well [TD-DTW] 27.84 GALLONS PER FOOT (gpf) Gallons per foot (GPF); from chart 0.16 1% = 0.05 2" = 0.16 3" = 0.37 4" = 0.65 Gallons in Well (WC x GPF) 4.45 = Well Casing Volume (WCV) 1% = 0.09 2% = 0.26 3% = 0.50 6" = 1.47
Water Column (WC) in Well [TD-DTW] 27.84 GALLONS PER FOOT (gpf) Gallons per foot (GPF); from chart 0.16 1%" = 0.05 2" = 0.16 3" = 0.37 4" = 0.65 Gallons in Well [WC x GPF] 4.45 = Well Casing Volume (WCV) 1%" = 0.09 2%" = 0.25 3%" = 0.50 6" = 1.47
Gallons per foot (GPF); from chart 0.16 1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65 Gallons in Well [WC x GPF] 4.45 = Well Casing Volume (WCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Gallons in Well [WC x GPF] 4.45 = Well Casing Volume (WCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 5" = 1.47
Evacuation Method and Material Disposable hailer with poly propuleur core
Evacuation Method and Material Disposable hailer with poly propuleine cone
Disposition Delivery Property 104
SAMPLING DATA AND
FIELD PARAMETERS
Color: Brown BLACK Odor: None/SLWisp Sheen Turbidity: STAINED Well Volumes 1st 2nd 3nd 4th 5th final
pH: 9.94 9.94 9.96 9.96
Specific Conductance: 1882 1961 1994 1991 Temperature: 14° 14° 14° 14°
Temperature: 14° 14° 14°
Sampling Method and Material(s): Dispose ble bailer with polypropylene rope
Container Description Preservative
Parameters to be Analyzed From Lab X or HMI preserved by: Lab X or HMI
Diss As, Be, Mn, Na, V 500 mc Plastic Hwoz-field filtered / micron
(
PCE 2×40mL Glass HCL
Sampling Personnel: J (amphell 5 Mewsky
Commerts:
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Project Name: Ormet						Sar	mple ID: MW-5
Project Number: HM003.0	3			_			oficate ID:
Site Location: Hannihal, Ohio						Tin	ne Sampling Began: 7:35
Sampling Date: 9/1/95		Weather:	Sunny	_ ს5°		Tin	ne Sampling Completed; 8:05
		_					
			EV	ACUATION	DATA		
							•
Description of Measuring	ig Point (MP	To	o of	PUC			
	MP Elevation	n	·	Diamet	er of Weil (Casing	_a"
Total Sounded Depth of Well Be	low MP (TD) 9	1.88	Gail	ions to be F	urged	13.099
Depth to Water Belo	w MP (DTW	6	4.59	_ (3 MCA	s, 5 WCVs	, etc.)	
Water Column (WC) in W	eii ITO-DTW	72	7.29	_			GALLONS PER FOOT (gpf)
Gallons per foot (GPF); from char	t1	2.16	_			1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Wel	(WC x GPF	1	1.3664	_= Weil Ca	sing Volum	ie (WCV)	1%"=0.09 2%"=0.26 3%"=0.50 6"=1.47
Evacuation Method	and Materia	i Dispo	sable	bailer	with	poly p	propylene rope
		,					,,
		1	SAI	MPLING DA	TA AND		
		<u></u>	FIE	LD PARAM	ETERS		
f							0.7001
Color: TINT BROWN	,35	Odor:	NONE	1 Th	-75		rbidity: CLEAR TINT
Well Volumes		and	378	4 th	5 th	final	
pH:	8.54	8.61	8.62	8.66			
Specific Conductance:	1222	1227	1226	1219			
Temperature:	140	14°	140	140		<u> </u>	
Sampling Method an	d Materialis	r Dism	a hla h	ر موازم	uita s	مرادمح	opylene rope
Jamping Medios an	o materiore.	· <u> </u>		er Descripti		Diy pi o	Preservative
Parameters to be Analyz	ed			ıb <u>X</u> ar H			preserved by: Lab X or HMI
				L Plas			HNO2- field filtered Imicron
Diss As, Be, Ma, No.	•			L Plas	•		NAOH
Cn-total, Cn-am							4°C
PCE			2270	mL Gla	دخخ		HCL
			· · · · · · · · · · · · · · · · · · ·				·
Sampling Po	ersonnei:	JU	umphell		Menos	<u>ky</u>	
Co	mments:		•			<i>'</i>	
					·····		
			·				



Page	of	
Page	of	

Project Name: Ormet	 					San	noie ID: //I()-	1d	
Project Number: HM003.0	\$			_		Rep	licate ID:		
Site Location: Hannihal	Onio			_		Tim	e Sampling Began:	1:25	
Sampling Date: 911198	Sunny	80°	· 	Tim	e Sampling Completed	1:2:00			
Description of Measurin			ev.	PVC			a"		
	MP Elevation		9 211	_	er of Weil C				
Total Sounded Depth of Weil Be			8.24	_	lons to be P		21.86		
Depth to Water Below			2.68	_	/s, 5 WCVs	, etc.)	CALLONS	DES EDOT /c=fl	
Water Column (WC) in W			<u>45.50</u>	<u>e</u>				PER FOOT (gpf)	
Gallons per foot (GPF).16 2896	M-# C		- N/C\/	1%" = 0.06 2" = 0.16		
Gallons in Wei	I IWC X GPF	·1	20,0	= Well C	sing volum	e (WCV)	1%" = 0.09 2%" = 0.25	3%" = 0.50 6" = 1.47	
Evacuation Method	Evacuation Method and Material Disposable bailer with poly propylene cope SAMPLING DATA AND								
		<u> </u>	FE	LD PARAM	ETERS				
Color: CLEAR			HONE				bidity: CLEAR		
Well Volumes	131	and.	3 nd	4 th	5 Th	final			
pH:	7.12	7.30	7.34	7.38		<u> </u>			
Specific Conductance:	466	468	470	481					
Temperature:	15°	15°	15°	15	<u> </u>	<u> </u>			
Sampling Method an	d Material(s	: Dispos		CILLY Descript	,	oly pro	. ,	rvative	
Parameters to be Analyz	eci			b X or H		·		ab <u>乂</u> or HMI	
				L Plas			_	Hered Imicron	
Diss As, Be, Ma, Na	•			L Plas			NAOH	THE THIRT OF	
Cn-total, Cn-am				nl Pla			4°C		
Spec Coud, pH, F				AL PIG	SIIC		7.0		
	<u> </u>								
Sampling Pe	ersonnel: mments:	J (0	imphell	, 5	Menosl	y			
[



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				Sample ID: MW-16				
Project Number: HM003.0B						Res	olicate ID:	
Site Location: Hannihal	Ohio					Tin	ne Sampling Began: 10:00	
Sampling Date: 9/1/9	7	Weather:	SUNNY	70°		Tin	ne Sampling Completed: 10:30	
· · ·								
	·			ACUATION	DATA			
Description of Measuring	_		P OT	PVC		·anina	a "	
	MP Elevation		3.11	_	er of Well C	-		
Total Sounded Depth of Well Be			8.42		lons to be P	_	16.65	
Depth to Water Belo Water Column (WC) in W			4.69	(3 WC)	/s, 5 WCVs	, etc.)	GALLONS PER FOOT (gpf)	
).16	-				
Gallons per foot (GPF Gallons in Wel			5.5504	— = Well C	eion Volum	e (WCV)	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47	
Gallons in Wel	i (WC X GFF	¹	1.5507	wen C	ising voicin	IC (AACA)	17 = 0.09 27 = 0.20 37 = 0.30 0 = 1.47	
Evacuation Method	and Materia	1_Dispo	sable 1	bailer	with	poly p	ropylene rope	
		1	SAI	MPLING DA	TA AND			
			FIE	LD PARAM	ETERS			
Color: LT. BROWN		Odor:	HOH€			Tur	bidity: STAINED CLOUDY	
Well Volumes	131	and.	3 rd	4 th	5 Th	final		
pH:	7.20	7.31		1	1	ł	ļ.	
			7.41	7.50				
Specific Conductance:	764	784	דדד	790				
Specific Conductance: Temperature:	764 [4°							
	140	784 14°	777 14° 26/2 b	790 14°		ply pro	pylene rope Preservative	
Temperature:	다.	784 14°	777 14° Seble b	790 14°	ian	plypro	Preservative	
Temperature: Sampling Method an	다.	784 14°	777 14° Contain	790 14° Mediler to the Description of H	ian /	plypro	Preservative preserved by: Lab X or HMI	
Temperature: Sampling Method and Parameters to be Analyze Diss As, Be, Ma, Na.	「共 ^o d Material(s)	784 14°	777 14° Contain From La	790 14° caller the Description X or H	ian MI	plypro	Preservative preserved by: Lab X or HMI HWO3 - field filtered Imicron	
Temperature: Sampling Method and Parameters to be Analyzed Diss As, Be, Ma, Na, Can-total, Can-ame	「共 ^o d Material(s)	784 14°	777 14° contain From La 500 m 250 m	790 14° L Plas	ian MI Hic	ply pro	Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH	
Temperature: Sampling Method and Parameters to be Analyze Diss As, Be, Ma, Na.	「共 ^o d Material(s)	784 14°	777 14° Contain From La	790 14° vailer inter Descript b X or H L Plass	ian MI Hic	poly pro	Preservative preserved by: Lab X or HMI HWO3 - field filtered Imicron	
Temperature: Sampling Method and Parameters to be Analyzed Diss As, Be, Ma, Na, Can-total, Can-ame	「共 ^o d Material(s)	784 14°	777 14° contain From La 500 m 250 m	790 14° L Plas	ian MI Hic	poly pro	Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH	
Temperature: Sampling Method and Parameters to be Analyzed Diss As, Be, Ma, Na, Can-total, Can-ame	「共 ^o d Material(s)	784 14°	777 14° contain From La 500 m 250 m	790 14° L Plas	ian MI Hic	poly pro	Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH	
Temperature: Sampling Method and Parameters to be Analyza Diss As, Be, Ma, Na, Can-total, Can-ame Spec Cond, pH, F Sampling Pe	f4° d Material(s) ed enable	784 14°	777 14° contain From La 500 m 250 m	790 14° vailer inter Description X or H L Plass L Plass	ian MI Hic		Preservative preserved by: Lab X or HMI HNO3 - field filtered / micron NAOH	



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Project Name: Ormet						San	noie ID- MW-18
Project Number: HM003.03						Rep	dicate ID:
Site Location: Hannihal, Ohio				_		Tim	e Sampling Began: 8:50
Sampling Date: 9/1/98 Weather: Sunny			70°		Tim	e Sampling Completed: 9:20	
						;	
		1	EV.	ACUATION	DATA		
		_	^	_			
Description of Measuring	g Point (MP	1To	p of	PVC			
	MP Elevation				er of Well C	_	<u> </u>
Total Sounded Depth of Well Be			7.00	-	lons to be P		8.23
Depth to Water Below			7.85 ·	_ (3 MC/	/s, 5 WCVs,	, etc.)	
Water Column (WC) in W			.15	-			GALLONS PER FOOT (gpf)
Gallons per foot (GPF).16 744	w_n ^		~ UV/~~	1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Wel	1 (44C X GLL	·	J-7-1	_= 4VEII C	asing volum	e (AACA)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method	and Materia	i Dien	ا ماماء	heilar		20/12	ropylene rope
Fragagadi, medioa		"_Uspu	عون الــــا	UMI ICY	WILL	POYP	opins rep
			SAI	MPLING DA	TA AND		
		! !		LD PARAM			
Color: Brown		Odor:	HOHE	L. WISP	SHEEN	Tur	bidity: SILTY/CLOUDY
Well Volumes	151	and.	3rd	4th	5 m	final	
<u>pH:</u>	9.60	9.80	9.85	9.88	 _	<u> </u>	
Specific Conductance:	3460	3470	3550	3590		ļ	
Temperature:	13.5	13.5	14.0	14.0	L	L	
Sampling Method an	d Material(s	: Disco:	sable k	riler	with a	ply pro	oulene rope
				ner Descript	,	77	Preservative
Parameters to be Analyz	ed		From La	ib <u>X</u> or H	МІ		preserved by: Lab X or HMI
Diss As, Be, Ma, Na	. ✓		500 m	L Plas	tic		HNO2- field filtered Imicron
Cn-total, Cn-am				L Plas	_		NAOH
1				nl Pla			4°C
Spec Cond, pH, F		- · -			455		HCL
1 77		- -	80 K	<u> </u>	427		
							
C		+ /	.).11	_	.00	1	
Sampling P		علىك	umphell	13	Menosi	<u> </u>	
Co	mments:					·	
1							
L							



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Project Name: Ormet						Sar	noie 10: MW-28
Project Number: HM003.C	18					Ren	olicate ID: MW-28d
Site Location: Hannihal					Tim	ne Sampling Began: 9:20	
Sampling Date: 9/1/98 Weather: SUNNY 70°						Tim	ne Sampling Completed: 9:50
			EV.	ACUATION	DATA		
Description of Measuri	ng Point (MF	n <u>To</u>	p of	PVC	. <u> </u>		
	MP Elevation	n	f 	Diamet	er of Well (Casing	a"
Total Sounded Depth of Well Be	elow MP (TE)4	6.06	Gail	ons to be F	urged	12.0
Depth to Water Belo	W MP (DTW	n 2	ما0 ا	_ (3 WCV	s, 5 WCVs	, etc.)	
Water Column (WC) in W	eii (TD-OTW	<u> 2</u>	5.00	_			GALLONS PER FOOT (gpf)
Gallons per foot (GPF	7; from char	t(2.16				11/4" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in We	II [WC × GPF	7	4.00	_= Well Ca	sing Volum	e (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47
Evacuation Method	and Materia	ı Dispo	sable	bailer	with	poly p	copylene rope
		- (,, ,
*·- ·		1	SA	MPLING DA	TA AND		
		<u>i</u>	FIE	LO PARAMI	ETERS		
Color: TAN			HONE			T	bidity: CLOUDY
Well Volumes	1 ⁵ T	and.	3rd	4th	5 Th	final	
<u>pH:</u>	6.81	5.54	5.40	5.28		ļ	
Specific Conductance:	516	527	531	527			
Temperature:	15	15	15	15		<u></u>	
		· •	. 11 1.	1.	• 1.		
Sampling Method an	id Materialis	: Uspo:				<u>ply pro</u>	· •
				ner Descripti			Preservative
Parameters to be Analyz				ib <u>X</u> or Hi			preserved by: Lab X or HMI
Diss As, Be, Ma, Na	, 		<u>.500 m</u>	L Plast	ic		HNO3- field filtered / micron
Cn-total, Cn-am	enable		250 m	L Plast	ic		NAOH
Spec Cond, pH, F			250 n	nl Plas	stic		4°C
					·		
		_					
		<u>_</u>					
Sampling Po	ersonnel:	71	العلميين	<	Maure		
	mments:		unphell	1	Menosl	/	
							
1							
î .							



V HMI										
Environmental Consultin	g Sarices		WATER	R SAMP	LING L	OG	Page of			
Project Name: Ormet							Sample ID: MW-31			
Project Number: HM003.0	١٩			_			Replicate ID: MW-31d			
Site Location: Hannihal				_			Time Sampling Began: 10:40			
Sampling Date: 9/1/9	8		Time Sampling Completed: 11:10							
, ,					·-·					
	•						7			
		<u></u>	EV	ACUATION	DATA		<u> </u>			
		_	_							
Description of Measuri	ng Point (MP	110;	p of	PVC						
	MP Elevation				er of Well (_				
Total Sounded Depth of Well Be			7.51 6.40	_	ons to be F	•				
Depth to Water Belo		, etc.)								
Water Column (WC) in Well [TD-DTW] 21.11							GALLONS PER FOOT (gpf)			
Gallons per foot (GPF); from chart 0.16							11%" = 0.05 2" = 0.18 3" = 0.37 4" = 0.65			
Gallons in Well [WC x GPF] 3.3776 = Well Casing Volume (WCV) 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47										
Evacuation Method	l and Materia	n Diese	eable 1	he: lase	4	201-	y propulme cope			
EASCOSHOL INSPIRED	Evacuation Method and Material Disposable bailer with poly propylene rope									
		ī	SAN	VIPLING DA	TA AND					
		ļ		LD PARAM						
							-			
Color: Brown BLACK		Odor: ;	HOHE				Turbidity: STAINED CLOUDY			
Well Volumes	151	and.	3 nd	4th	5 th	fin	al			
:Hq	9.65	9.87	9.85	9.86						
Specific Conductance:	2020	2560		2520		 				
Temperature:	15°	15°	15°	15°		<u></u>				
	. d 8.6	. D.	. I.I. Ia	1.	. 4		1			
Sampling Method ar	o Materialis	<u>013003</u>				DIY P	propylene rope			
Parameters to be Analyz	rad			ner Descript			preserved by: Lab X or HMI			
		From Lab X or HMI				HNO2- field filtered Imicron				
Diss As, Be, Ma, No.		500 ML Plastic								
Cn-total, Cn-am		250 ml Plastic				NAOH				
Spec Cond, pH, F	_ `_	<u>250 n</u>	nl Pla	stic		<u> 4°C</u>				
PCE		2×40	mL Gl	455		HCL				
										

J Campbell , 5 Menosky

Sampling Personnel:

Comments:



Page ____ of ____

Project Name: Ormet			<u>-</u> -	Sample ID: MW-32						
Project Number: HM003.0				Reolicate ID:						
Site Location: Hannihal					Time	e Sampling Began: 9-11:15				
Sampling Date: 9/1/9	Weather: _	Sunn	14 75°	···	Time	e Sampling Completed: 11:40				
										
										
			EV.	ACUATION	DATA					
·										
Description of Measuring	ng Point (MP	1 <u>To</u>	p of	PVC						
	MP Elevation	·	• 	Diamer	Diameter of Well Casing 2"					
Total Sounded Depth of Well Be	elow MP (TD		7.18	Gal	Gallons to be Purged 8.496					
Depth to Water Belo	w MP (DTW		9.48	_ (3 MC/	(3 WCVs, 5 WCVs, etc.)					
Water Column (WC) in W	ell ITD-DTW	ı <u>ı,</u>	7.70	_		ļ	GALLONS PER FOOT (gpf)			
Gallons per foot (GPF	7; from char		0.16	_		}	11/4" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65			
Gallons in Wel	I (WC x GPF	ī <u>2.</u>	832	_= Weil C	ising Volum	re (WCV)	1%"= 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47			
Evacuation Method	and Materia	"_Dispo	sable	bailer	with	poly pa	opylene rope			
		-								
		į		MPLING DA						
		<u>_</u>	FIE	LD PARAM	ETERS					
Coior: BROWN BLACK		Odom	NONE			To such	nidity: STAINED			
Color: BROWN BLACK	,5	and.	3rd	4th	5 Th	final	ILLICY. OTAINED			
pH:	8.00	8.00	8.10	8.26		77447				
Specific Conductance:	652	678	703	760		1				
Temperature:	15°	15°	15°	15°		1				
	!	<u></u>		 						
Sampling Method an	d Material(s)	: <u>Dispo</u> :	seble b	railer 1	with F	plypros	pylene rope			
		•		ner Descript		. / * *	Preservative			
Parameters to be Analyzed From Lab					мі		preserved by: Lab X or HMI			
Diss As, Be, Mn, Na, V 500 ML					ic	<u> </u>	HNO3- field filtered 1 micron			
, -					Plastic NAOH					
Spec Cond, pH, F 250 ML							4°C			
						•				
						 .				
C! 7-		+ /	H	_) <u>.</u>				
					Menos	y				
Con	mments:									
1										



Page of

Project Name: Ormet			_	Sample 10: Mu) - 35				
Project Number: HM003.0					Rep	icate ID:		
Site Location: Hannihal					Tim	Time Sampling Began: 6:15		
Sampling Date: 8/31/95	Weather:	Sunny	75°		Tim	Sampling Completed: 6:50		
			•					
•								
l			EVA	ACUATION	DATA			
•								
Description of Measuring	ig Point (MP	1 <u>To</u> .	p of	PVC				
MP Elevation					er of Well C	asing	a"	
Total Sounded Depth of Well Below MP (TD) 46.70					ons to be P	urged	4.9872	
Depth to Water Beio	w MP (DTW		16.31	_ IS MCA	s, 5 WCVs,	, etc.)		
Water Column (WC) in W	eil [TD-DTW	1	0.39	_			GALLONS PER FOOT (gpf)	
Gallons per foot (GPF	; from char		0.16			·	1%"=0.06 2" = 0.16 3" = 0.37 4" = 0.65	
Gallons in Wel	(WC x GPF	·	.6624	_= Weil Ca	sing Volum	e (WCV)	1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47	
		_		. 1	- 41		,	
Evacuation Method	and Materia	" <u>Dispo</u>	sable l	parler	with_	poly p	opylene cope	
				451 146 5 4				
		1		MPLING DA' LD PARAMI				
		<u> </u>	FIE	LU PARAMI	I Eno			
Color: Brown		Odor:	HONE			Turi	oidity: STAINED	
Well Volumes	įβT	and.	3rd	4m	5 Th	final		
pH:	6.51	7.00	8.27	8.58	8.90			
Specific Conductance:	361	400	592	630	778			
Temperature:	15	14.5	15	15	15			
		_			_		•	
Sampling Method an	d Material(s	: <u>Dispo</u> :	sable b	uiler u	uith p	olypro	pylene rope	
Container D						-	Preservative	
Parameters to be Analyzed From Lab			or HMI			preserved by: Lab X or HMI		
Diss As, Be, Mn, Na, V 500 ml			- Plastic			HNO3 - field filtered / micron		
•				L Plas	lic		NAOH	
Spec Cond, pH, F 250 m			L Plastic			4°C		
		_						
Sampling Personnel: J Camphell S Menosky								
comments: Well went Dry after 3 gallons								
Color does not -					. 1	~ .		
1				, T		 1		



WATER SAMPLING LOG

Page _	of _	

Project Name: Ormet				_		San	noie ID: MW-36
Project Number: HM003.C) 5		···			Rec	licate ID:
Site Location: Hannihal	Ohio			_		-	e Sampling Began: 2:10
Sampling Date: 9/1/9	<u>g'</u>	Weather: _	Sunne	y 75°		Tim	e Sampling Completed: 2:45
Description of Measuring Total Sounded Depth of Well Be Depth to Water Belo Water Column (WC) in W Gallons per foot (GPF) Gallons in Well	MP Elevation elow MP (TD w MP (DTW ell (TD-DTW ell (TD-DTW ell (WC x GPF	5	p of 14.50 17.71 16.79 1.16 1.0864	Gall (3 WCv ≃ Well Ca	er of Well C ions to be P 's, 5 WCVs, asing Volum	urged , etc.) e (WCV)	Q" B.0592 GALLONS PER FOOT (gpf) 1%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65 1%" = 0.09 2%" = 0.26 3%" = 0.50 6" = 1.47 TOPYIENE TOPE
							7/
		į	SAN	MPLING DA	TA AND		
			FIE	LD PARAM	ETERS		
<u>.</u>							
Color:	,sT	and.	3rd	4m	5 Th	final	bidity:
Well Volumes	<u> </u>				10.10	7)1141	
pH:	10.18	10.15	4380	10.08	H380		
Specific Conductance: Temperature:	15°	15°	15°	/5°	720	<u>. </u>	
TEMPERETURE:		1-2	. 12	70		L	
Sampling Method an	d Material(s	: Dispo:		er Descripti	1	olypro	pylene rope Preservative
Parameters to be Analyz	ed			b <u>X</u> or H			preserved by: Lab X or HMI
Diss As, Be, Ma, Na				L Plast			HNO2- field filtered Imicron
Cn-total, Cn-am	•	green to		L Plas	_		NAOH
Spec Coud, pH, F	.56	_	250 m				4°C
- HE CONCI PER PE			00011				
	**	ing die de la company de la company de la company de la company de la company de la company de la company de l La company de la company d	<u> </u>				
Sampling Po	ersonnei: mments:	J (c Solo	imphell r did v	61 FU	Menosk Tu- o	<u> </u>	· · · · · · · · · · · · · · · · · · ·
						····	



WATER SAMPLING LOG

Page ____ of

Project Name: Ormet			 			Sam	pie ID: MW-37
Project Number: HM003.0	195			_		Repl	icate ID: ~
Site Location: Hannihal	Ohio					Time	Sampling Began: 6:50
Sampling Date: 8/31/99	8	Weather: _	Sunny	75°	····	Time	Sampling Completed: 7:15
·				, 			
			. .		<u></u>		
			EV	ACUATION	DATA		·
			•				·
Description of Measuring	ng Point (MF	7 <u>To</u>	p of	PUC	·		
	MP Elevation	n	 - 	Diamet	er of Weil (Casing	a"
Total Sounded Depth of Well Be	low MP (TE	3	6.98	Gal	lons to be P	Purged _	8.48
Depth to Water Belo	W MP (DTW	n	9.31	(3 WC/	/s, 5 WCVs	, etc.)	·
Water Column (WC) in W	eli [TD-DTW	<u>ı</u>	7.67	_		-	GALLONS PER FOOT (gpf)
Gallons per foot (GPF	7; from char		2.16	_			11/4" = 0.06 2" = 0.16 3" = 0.37 4" = 0.65
Gallons in Wel	I (WC × GPF	2.	8272	_= Weil C	sing Volum	ne (WCV)	1 1/4" = 0.09 2 1/4" = 0.26 3 1/4" = 0.50 6" = 1.47
				_		_	
Evacuation Method	and Materia	" Dispo	sable 1	pailer	with	poly po	opylene rope
		[e a a	API INC CA	TA AND		
1		į		MPLING DA LD PARAM			
		<u> </u>		ED PARAIN	E I ENS	<u>-</u>	
Color: Brown		Odor:	NONE			Turb	idity: SILTY CLOUDY
Well Volumes	IST	and.	300	4th	5Th	final	T
pH:	8.17	8.27	8.25	8.26	<u> </u>		
Specific Conductance:	676	680	672	682			
Temperature:	15	15	15	15			
Sampling Method an	d Material(s): <u>Dispo</u> :	seble b	ailer 1	with F	<u>ply prop</u>	pylene rope
		•	Contain	er Descript	ion .	. , ,	Preservative
Parameters to be Analyz	ed		From La	b X or H	MI		preserved by: Lab X or HMI
Diss As, Be, Ma, No.	, v		.500 m	L Plas	Fic		HNO3- field filtered Imicron
Cn-total, Cn-am	enable		250 m	L Plas	tic		NAOH
Spec Cond, pH, F			250 n	nL Pla	stic		4°C
							- -
							
Sampling Po	ersonnei:	T (.	mobell	<	Maure	b.,	
_	mments:		1		UTTOWN	7_	
1	munents;		r'does	LOT	tilter C	JU I	
1			 _			<u> </u>	

APPENDIX B

LABORATORY ANALYTICAL REPORTS

Appendix B-1	Laboratory Analytical Report for May 1997 Monitoring Event
Appendix B-2	Laboratory Analytical Report for May 1998 Monitoring Event
Appendix B-3	Laboratory Analytical Report for August/September 1998 Monitoring Event

APPENDIX B-1

LABORATORY ANALYTICAL REPORT FOR MAY 1997 MONITORING EVENT



KEMRON Environmental Services 109 Starlite Park Marietta, Ohio 45750

Phone: (614) 373-4071

Ormet Corporation Hydrosystems Management Inc. 331 S. Main Street, Suite 109 Washington, PA 15301 Attn: Bob Fargo

Login #: 97-05-082 Date Received: 05/06/97

Date Completed: 05/28/97
Date Completed: 05/28/97
Date Reported: 05/28/97 14:00
Work ID: HM003.07/ORMET/HANNIBAL, OHIO

Client Code: ORMET-086

SAMPLE IDENTIFICATION

Sample	Sample	Sample	Sample
Number	Description	Number	Description
01	MW-15	02	MW-17
03	MW-32	04	MW-34S
05	MW-34D	06	MW-35
07	MW-36	08	MW-37
09	MW-41	10	MW-DUP-1

All results for soils/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the prior written approval of KEMRON.

Certified by Deanna Hesson

KEMRON ENVIRONMENTAL SERVICES RESULTS BY SAMPLE

This is to certify that the following samples were analyzed using good laboratory practices to show the following results.

SAMPLE ID: 01 MW-15 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZEI) BY	METHOD
Cyanide, Amenable to Cl	0.20	0.10	mg/L	05/15/97	JWR	335.1
Cyanide, Total	2.8	0.10	mg/L	05/08/97	JWR	335.2\9010
Fluoride	11	1.0	mg/L	05/13/97	REB	340.2
pH (Laboratory)	7.4		s.u.	05/07/97	SCM	150.1
Specific Conductance	800	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/09/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.02	0.01	mg/L	05/14/97	JYH	6010A
Sodium, Dissolved	140	0.5	mg/L	05/14/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97	JYH	6010A

SAMPLE ID: 02 MW-17 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZEI	BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/15/97	JWR	335.1
Cyanide, Total	0.54	0.050	mg/L	05/08/97	JWR	335.2\9010
Fluoride	3.1	0.10	mg/L		REB	340.2
pH (Laboratory)	7.5		s.u.	05/07/97	SCM	150.1
Specific Conductance	870	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/09/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	1.9	0.01	mg/L	05/14/97	JYH	6010A
Sodium, Dissolved	30	0.5	mg/L		JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L		JYH	6010A

SAMPLE ID: 03 MW-32 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	1.3	0.25	mg/L	05/15/97	JWR	335.1
Cyanide, Total	4.4	0.25	mg/L		JWR	335.2\9010
Fluoride	19	1.0	mg/L		REB	340.2
pH (Laboratory)	8.7		s.Ū.	05/07/97	SCM	150.1
Specific Conductance	930	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	0.008	0.004	mg/L	05/09/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	1.1	0.01	mg/L	05/14/97	JYH	6010A
Sodium, Dissolved	110	0.5	mg/L			6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97		6010A

SAMPLE ID: 04 MW-34S Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl Cyanide, Total Fluoride	0.040 0.18 8.1	0.020 0.020 0.20	mg/L	05/15/97 05/08/97 05/13/97	JWR	335.2\9010

"OTES AND DEFINITIONS:

SAMPLE ID: 04 MW-34S Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	ву	METHOD
pH (Laboratory)	7.4		s.u.	05/07/97	SCM	150.1
Specific Conductance	710	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/09/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.04	0.01	mg/L	05/14/97	JYH	6010A
Sodium, Dissolved	69	0.5	mg/L	05/14/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97	JYH	6010A

SAMPLE ID: 05 MW-34D Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/15/97	JWR	335.1
Cyanide, Total	0.050	0.010	mg/L	05/08/97	JWR	335.2\9010
Fluoride	3.6	0.10	mg/L	05/13/97	REB	340.2
pH (Laboratory)	7.4		s.u.	05/07/97	SCM	150.1
Specific Conductance	630	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/09/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.79	0.01	mg/L	05/14/97	JYH	6010A
Sodium, Dissolved	31	0.5	mg/L		JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97	JYH	6010A

SAMPLE ID: 06 MW-35 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	1.0	mq/L	05/15/97	JWR	335.1
Cyanide, Total	16	1.0	mg/L	05/08/97	JWR	335.2\9010
Fluoride	40	1.0	mg/L	05/13/97	REB	340.2
pH (Laboratory)	9.4		s.v.	05/07/97	SCM	150.1
Specific Conductance	1000	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	0.02	0.004	mg/L	05/09/97	KHA	7060
Beryllium, Dissolved	0.0006	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.68	0.01	mg/L	05/14/97	JYH	6010A
Sodium, Dissolved	220	0.5	mg/L	05/14/97	JYH	6010A
Vanadium, Dissolved	0.02	0.01	mg/L	05/14/97	JYH	6010A

SAMPLE ID: 07 MW-36 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	3.5	0.50	mg/L	05/15/97	JWR	335.1
Cyanide, Total	9.2	0.50		05/08/97	JWR	335.2\9010
Fluoride	180	5.0		05/13/97	REB	340.2
pH (Laboratory)	9.8		s.u.	05/07/97	SCM	150.1
Specific Conductance	3600	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	0.084	0.008		05/09/97		7060
Beryllium, Dissolved	0.0035	0.0005	mg/L			7091
Manganese, Dissolved	1.7	0.01	mg/L			6010A
Sodium, Dissolved	850	0.5	mq/L	05/14/97		6010A

'OTES AND DEFINITIONS:

SAMPLE ID: 07 MW-36 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZEI	D BY	METHOD	
Vanadium, Dissolved	0.1	0.01	mg/L	05/14/97	JYH	6010A	

SAMPLE ID: 08 MW-37 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	1.7	0.50	mg/L		JWR	335.1
Cyanide, Total	13	0.50	mg/L	05/08/97	JWR	335.2\9010
Fluoride	53	1.0	mg/L	05/13/97	REB	340.2
pH (Laboratory)	9.2		s.u.	05/07/97	SCM	150.1
Specific Conductance	1100	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	0.027	0.004	mg/L	05/09/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.56	0.01	mg/L		JYH	6010A
Sodium, Dissolved	210	0.5	mg/L	05/14/97	JYH	6010A
Vanadium, Dissolved	0.02	0.01	mg/L		JYH	6010A

SAMPLE ID: 09 MW-41 Collected: 05/06/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	IINITS	DATE ANALYZED	RV	METHOD
						
Cyanide, Total Fluoride	ND 0.20	0.010 0.10	mg/L mg/L			335.2\9010 340.2
pH (Laboratory)	6.8	0.10	S.U.	05/07/97		150.1
Specific Conductance	4900	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	0.022	0.004	mg/L	05/09/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	1.6	0.01	mg/L	05/14/97	JYH	6010A
Sodium, Dissolved	21	0.5	mg/L	05/14/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/14/97	JYH	6010A

SAMPLE ID: 10 MW-DUP-1 Collected: 05/06/97 Category: Water

RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY METHOD
0.40	0.10	mq/L	05/15/97	JWR 335.1
3.3	0.10			JWR 335.2\901
8.9	0.10			REB 340.2
7.4		s.u.	* . *	SCM 150.1
800	1	umho/cm	05/12/97	RJS 120.1
ND	0.004	mg/L	05/09/97	KHA 7060
ND	0.0005			KHA 7091
0.05	0.01			JYH 6010A
140	0.5			JYH 6010A
ND	0.01			JYH 6010A
	0.40 3.3 8.9 7.4 800 ND ND 0.05	RESULT LIMIT 0.40 0.10 3.3 0.10 8.9 0.10 7.4 800 1 ND 0.004 ND 0.0005 0.05 0.01 140 0.5	RESULT LIMIT UNITS 0.40 0.10 mg/L 3.3 0.10 mg/L 8.9 0.10 mg/L 7.4 S.U. 800 1 umho/cm ND 0.004 mg/L ND 0.0005 mg/L 0.05 0.01 mg/L 140 0.5 mg/L	RESULT LIMIT UNITS ANALYZED 0.40 0.10 mg/L 05/15/97 3.3 0.10 mg/L 05/08/97 8.9 0.10 mg/L 05/13/97 7.4 S.U. 05/07/97 800 1 umho/cm 05/12/97 ND 0.004 mg/L 05/09/97 ND 0.0005 mg/L 05/27/97 0.05 0.01 mg/L 05/14/97 140 0.5 mg/L 05/14/97

'OTES AND DEFINITIONS:



CHAIN - OF - CUSTODY RECORD

Project Number	Project Name/Location	ation					y Descripti	on/ Numbe	Container Description/ Number of Containers	ers.				
	Ormet / Henrihal Ohio	Circ	•	(4		1							T	
HM043.07	Laboratory) 2:4:		۶ ح	ננכל							·	
	Kemron		اره آليم	tsp	45	ינחו	-				•		=	
Sampling Personnel	4_		1 ^{1 -} .	/ *	W 71d H	19		-						
J-Campbell (C Standard)d5 1W	JM 1.2461	1000 1000 1000 1000 1000 1000 1000 100	יינמי								
		Sample	'# 09) '	i a	- - - - - - - - - - - - - - - - - - -								
Sample ID	Date/Tare	- 1		2S (A	ν.υ •:υ	NH NH			,				TOTAL	
MW-15	5-6-97	7	_	_									7	
mw-17			_	-	1								100	_
Mw-32			•	_	_) n	T
Mw-345			_		_) 11	T-
mw-34d			_	_	-) ~	T
M41-35		ς.	_		-) ~	
mw-36			_	_	-								7 ~	
M1.1-37				_	-								70	
M 41	>	>	_	-	-								7"	1
	•		•		+								1	-
Mw-Dvr-1	5-6-47	7		-	-								3	_
														_
														T
														T
Sample Code: L = Liquid;	Liquid; S = Solid; A	A = Air								Tota	Total Number of Containers:	f Containers	3	
	4/1/1]
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KEMRON Environmental Services 109 Starlite Park Marietta, Ohio 45750

Phone: (614) 373-4071

Ormet Corporation Hydrosystems Management Inc. 331 S. Main Street, Suite 109 Washington, PA 15301 Attn: Bob Fargo

Login #: 97-05-164 Date Received: 05/09/97

Date Completed: 05/28/97 Date Completed: 05/28/97 Date Reported: 05/28/97 14:45 Work ID: HM003.07/ORMET

Client Code: ORMET-086

SAMPLE IDENTIFICATION

Sample	Sample	Sample	Sample	
Number	Description	Number	Description	
01	MW-1	02	MW-11	
03	MW-16	04	MW-29S	
05	MW-28	06	FIELD BLANK	

All results for soils/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the prior written approval of KEMRON.

Certified by Deanna Hesson

KEMRON ENVIRONMENTAL SERVICES RESULTS BY SAMPLE

This is to certify that the following samples were analyzed using good laboratory practices to show the following results.

SAMPLE ID: 01 MW-1 Collected: 05/09/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/14/97	JWR	335.2\9010
Fluoride	0.10	0.10	mg/L	05/13/97	REB	340.2
pH (Laboratory)	5.9		s.v.	05/09/97	DJP	150.1
Specific Conductance	470	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	ND	0.004	mq/L	05/15/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.13	0.01	mg/L		JYH	6010A
Sodium, Dissolved	19	0.5	mg/L	05/21/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/21/97	JYH	6010A

SAMPLE ID: 02 MW-11 Collected: 05/09/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/20/97	JWR	335.1
Cyanide, Total	0.090	0.010	mg/L	05/14/97	JWR	335.2\9010
Fluoride	1.8	0.10	mg/L	05/13/97	REB	340.2
pH (Laboratory)	7.8		s.u.	05/09/97	DJP	150.1
Specific Conductance	530	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.42	0.01	mg/L	05/21/97	JYH	6010A
Sodium, Dissolved	33	0.5	mg/L	05/21/97	JYH	6010A
Vanadium, Dissolved	N D	0.01	mg/L	05/21/97	JYH	6010A

SAMPLE ID: 03 MW-16 Collected: 05/09/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	0.30	0.10	mg/L	05/20/97	JWR	335.1
Cyanide, Total	1.3	0.10	mg/L		JWR	335.2\9010
Fluoride	11	1.0	mg/L		REB	340.2
pH (Laboratory)	7.6		s.u.		DJP	150.1
Specific Conductance	980	1	umho/cm	05/16/97	REB	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.43	0.01	mg/L	05/21/97	JYH	6010A
Sodium, Dissolved	130	0.5	mg/L	05/21/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/21/97	JYH	6010A

SAMPLE ID: 04 MW-29S Collected: 05/09/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.10	mg/L	05/20/97	JWR	335.1
Cyanide, Total	0.60	0.10		05/15/97		
Fluoride	44	1.0		05/13/97		
pH (Laboratory)	8.3		s.u.	05/09/97	DJP	150.1

'OTES AND DEFINITIONS:

SAMPLE ID: 04 MW-29S Collected: 05/09/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Specific Conductance	2200	1	umho/cm	05/16/97	REB	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.14	0.01	mg/L	05/21/97	JYH	6010A
Sodium, Dissolved	410	0.5	mg/L	05/21/97	JYH	6010A
Vanadium, Dissolved	N D	0.01	mg/L	05/21/97	JYH	6010A

SAMPLE ID: 05 MW-28 Collected: 05/09/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.020	mq/L	05/20/97	JWR	335.1
Cyanide, Total	0.11	0.020	mg/L	05/15/97	JWR	335.2\9010
Fluoride	0.20	0.10	mg/L		REB	340.2
pH (Laboratory)	5.6		s.u.	05/09/97	DJP	150.1
Specific Conductance	590	1	umho/cm	05/16/97	REB	120.1
Arsenic, Dissolved	ND	0.004	mq/L	05/15/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L		KHA	7091
Manganese, Dissolved	0.01	0.01	mg/L		JYH	6010A
Sodium, Dissolved	62	0.5	mg/L		JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/21/97	JYH	6010A

SAMPLE ID: 06 FIELD BLANK Collected: 05/09/97 Category: Water

	0,				
RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
ND	0.010	mq/L	05/15/97	JWR	335.2\9010
ND	0.10			REB	340.2
5.7		ຣ.ັບ.		DJP	150.1
1	1	umho/cm		REB	120.1
ND	0.004	mg/L		KHA	7060
ND	0.0005	mg/L	05/27/97	KHA	7091
ND	0.01			JYH	6010A
ND	0.5	mq/L		JYH	6010A
ND	0.01	mg/L		JYH	6010A
	ND ND 5.7 1 ND ND ND ND	RESULT REPORTING LIMIT ND 0.010 ND 0.10 5.7 1 1 ND 0.004 ND 0.0005 ND 0.01 ND 0.5	RESULT REPORTING LIMIT UNITS ND 0.010 mg/L ND 0.10 mg/L 5.7 S.U. 1 1 umho/cm ND 0.004 mg/L ND 0.0005 mg/L ND 0.01 mg/L ND 0.5 mg/L	RESULT LIMIT LIM	RESULT LIMIT LIMITS DATE ANALYZED BY

Environmental Consulting Services

CHAIN - OF - CUSTODY RECORD

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Project Number Proje		Sampling Personnel	Teambell /CS	•	0	MW-11	MW-16	MW-29s	1 1	Field Blank					-	Sample Code: $L = Liquid$;	Relinquished by:	Received by:	Relinquished by:	Received by:	REMARKS: Cooler	

Other

Lab Courier Kemiroca

Common Carrier

In Person

DELIVERY METHOD:



KEMRON Environmental Services 109 Starlite Park Marietta, Ohio 45750

Phone: (614) 373-4071

Ormet Corporation Hydrosystems Management Inc. 331 S. Main Street, Suite 109 Washington, PA 15301 Attn: Bob Fargo

Login #: 97-05-120 Date Received: 05/07/97

Date Completed: 05/28/97
Date Reported: 05/28/97 14:32
Work ID: HM003.07/ORMET HANNIBAL

Client Code: ORMET-086

SAMPLE IDENTIFICATION

Sample	Sample	Sample	Sample
Number	Description	Number	Description
01 03 05 07 09	MW-39S MW-12 MW-42D MW-40S MW-29D	02 04 06 08	MW-39D MW-42S MW-19 MW-40D

All results for soils/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the prior written approval of KEMRON.

Certified by Deanna Hesson

KEMRON ENVIRONMENTAL SERVICES RESULTS BY SAMPLE

This is to certify that the following samples were analyzed using good laboratory practices to show the following results.

SAMPLE ID: 01 MW-39S Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.20	mg/L	05/15/97	JWR	335.1
Cyanide, Total	3.6	0.20	mg/L	05/12/97	REB	335.2\9010
Fluoride	150	4.0	mg/L	05/13/97	REB	340.2
pH (Laboratory)	8.9		s.u.	05/08/97	DJP	150.1
Specific Conductance	5500	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	0.009	0.004	mg/L	05/15/97	ALÇ	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.15	0.01	mg/L	05/09/97	JYH	6010A
Sodium, Dissolved	1300	10	mg/L	05/13/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/09/97	JYH	6010A

SAMPLE ID: 02 MW-39D Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZEI) BY	METHOD
Cyanide, Amenable to Cl	0.060	0.010	mg/L	05/15/97	JWR	335.1
Cyanide, Total	0.060	0.010	mg/L	05/12/97	REB	335.2\9010
Fluoride	3.8	0.10	mg/L	05/13/97	REB	340.2
pH (Laboratory)	7.5		s.u.	05/08/97	DJP	150.1
Specific Conductance	630	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	ALC	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.87	0.01	mg/L	05/09/97	JYH	6010A
Sodium, Dissolved	32	0.5	. mg/L	05/09/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L		JYH	6010A

SAMPLE ID: 03 MW-12 Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	ву метно	D
Cyanide, Total	ND	0.010	mg/L	05/12/97	REB 335.2\90)10
Fluoride	0.90	0.10	mg/L	05/13/97	REB 340.2	
pH (Laboratory)	7.5		s.u.	05/08/97	DJP 150.1	
Specific Conductance	540	1	umho/cm	05/13/97	DJP 120.1	
Arsenic, Dissolved	· ND	0.004	mg/L	05/15/97	ALC 7060	
Beryllium, Dissolved	ND	0.0005	mg/L		KHA 7091	
Manganese, Dissolved	1.7	0.01	mg/L		JYH 6010A	
Sodium, Dissolved	19	0.5	mg/L		JYH 6010A	
Vanadium, Dissolved	ND	0.01	mg/L		JYH 6010A	

SAMPLE ID: 04 MW-42S Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZEI	BY METHOD
Cyanide, Amenable to Cl Cyanide, Total Fluoride pH (Laboratory)	ND 0.56 29 8.2	0.020 0.020 1.0	mg/L mg/L	05/15/97 05/12/97 05/13/97 05/08/97	REB 335.2\9010 REB 340.2

TOTES AND DEFINITIONS:

SAMPLE ID: 04 MW-42S Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Specific Conductance	1700	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	ALC	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.33	0.01	mg/L	05/09/97	JYH	6010A
Sodium, Dissolved	300	0.5	mg/L	05/09/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/09/97	JYH	6010A

SAMPLE ID: 05 MW-42D Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/20/97	JWR	335.1
Cyanide, Total	0.040	0.010	mg/L	05/14/97	JWR	335.2\9010
Fluoride	3.2	0.10	mg/L		REB	340.2
pH (Laboratory)	7.6		s.u.	05/08/97	DJP	150.1
Specific Conductance	580	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	ALC	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	1.3	0.01	mg/L	05/09/97	JYH	6010A
Sodium, Dissolved	27	0.5	mg/L	05/09/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/09/97	JYH	6010A

SAMPLE ID: 06 MW-19 Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.010	mq/L	05/20/97	JWR	335.1
Cyanide, Total	ND	0.010	mg/L	05/14/97	JWR	335.2\9010
Fluoride	2.0	0.10	mq/L		REB	340.2
pH (Laboratory)	7.4		s.v.	05/08/97	DJP	150.1
Specific Conductance	520	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	ND	0.004	mq/L		ALC	7060
Beryllium, Dissolved	ND	0.0005	mq/L	05/27/97	KHA	7091
Manganese, Dissolved	ND	0.01	mg/L	05/09/97	JYH	6010A
Sodium, Dissolved	18	0.5	mg/L	05/09/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/09/97	JYH	6010A

SAMPLE ID: 07 MW-40S Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	0.40	0.10	mg/L	05/20/97	JWR	335.1
Cyanide, Total	0.72	0.10	mg/L		JWR	335.2\9010
Fluoride	21	0.50	mq/L	05/13/97	REB	340.2
pH (Laboratory)	7.9		s.u.		DJP	150.1
Specific Conductance	1900	1	umho/cm		DJP	120.1
Arsenic, Dissolved	ND	0.004	mq/L			7060
Beryllium, Dissolved	ND	0.0005	mg/L		KHA	7091
Manganese, Dissolved	0.66	0.01	mq/L	, ,		6010A
Sodium, Dissolved	380	0.5	mg/L			6010A
Vanadium, Dissolved	ND	0.01	mg/L			6010A

NOTES AND DEFINITIONS:

SAMPLE ID: 08 MW-40D Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZEI	BY	METHOD
Cyanide, Amenable to Cl	ND	0.10	mg/L	05/20/97	JWR	335.1
Cyanide, Total	0.59	0.10	mg/L	05/14/97	JWR	335.2\9010
Fluoride	7.6	0.10	mg/L	05/13/97	REB	340.2
pH (Laboratory)	7.6		s.v.	05/08/97	DJP	150.1
Specific Conductance	1800	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	ALC	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	1.3	0.01	mg/L	05/13/97	JYH	6010A
Sodium, Dissolved	340	0.5	mg/L	05/13/97	JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/13/97	JYH	6010A

SAMPLE ID: 09 MW-29D Collected: 05/07/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.020	mg/L	05/20/97	JWR	335.1
Cyanide, Total	0.18	0.020	mg/L	05/14/97	JWR	335.2\9010
Fluoride	3.3	0.10	mq/L		REB	340.2
pH (Laboratory)	7.7		s.u.	05/08/97	DJP	150.1
Specific Conductance	600	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	ND	0.004	mq/L		ALC	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	2	0.01	mg/L		JYH	6010A
Sodium, Dissolved	31	0.5	mg/L		JYH	6010A
Vanadium, Dissolved	ND	0.01	mg/L		JYH	6010A

Environmental Consulting Services

CHAIN - OF -- CUSTODY RECORD

Page

Project Number	Project Name/Location	ation		\		0	ontainer De	scription	Number	of Cont	ainers					
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Sample ID	Date/Nime	Code	eg 0	3	'	C	#H								TOTAL	
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Sample Code: L = Liquid; S	7 Solid;	, A = Air										Total	Vumber o	Total Number of Containers:	s: 27	
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DELIVERY METHOD:	In Person		Con	Common Carri	arrier		\neg	Jab C	Lab Courier Kemiron	CHUNDA		:	Other			



KEMRON Environmental Services 109 Starlite Park Marietta, Ohio 45750

Phone: (614) 373-4071

Ormet Corporation
Hydrosystems Management Inc.
331 S. Main Street, Suite 109
Washington, PA 15301
Attn: Bob Fargo

Login #: 97-06-121 Date Received: 05/08/97 Date Completed: 06/09/97

Date Reported: 06/09/97 14:40 Work ID: HM003.07/ORMET/PRV. 05-156

Client Code: ORMET-086

SAMPLE IDENTIFICATION

Sample	Sample	Sample	Sample
Number	Description	Number	Description
01	MW-DUP-3		

All results for soils/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the prior written approval of KEMRON.

Certified by Maren M. Beery Order # 97-06-121 June 9, 1997 14:41

KEMRON ENVIRONMENTAL SERVICES RESULTS BY SAMPLE

Page 2

This is to certify that the following samples were analyzed using good laboratory practices to show the following results.

SAMPLE ID: 01 MW-DUP-3 Collected: 05/08/97 Category: Water

TEST	RESULT	REPORTING	DATE
DESCRIPTION		LIMIT	UNITS ANALYZED BY METHOD
Cyanide, Amenable to Cl	3.5(A)	0.010	mg/L 06/06/97 RJS 335.1

Order #97-06-121 June 9, 1997 14:41

KEMRON ENVIRONMENTAL SERVICES REPORT NARRATIVE

(CYANIDE) A = Due to lab error, the cyanide ammenable to chlorination was not previously run. The sample was analyzed out of the recommended hold time of fourteen (14) days.



KEMRON Environmental Services 109 Starlite Park Marietta, Ohio 45750

Phone: (614) 373-4071

Ormet Corporation

Hydrosystems Management Inc. 331 S. Main Street, Suite 109 Washington, PA 15301

Attn: Bob Fargo

Login #: 97-05-156 Date Received: 05/08/97

Date Completed: 05/30/97 Date Reported: 05/30/97 13:12 Work ID: HM003.07/ORMET

Client Code: ORMET-086

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	TRIP BLANK #1	02	MW-31
03	MW-30	04	MW-18
05	MW-2	06	MW-5
07	MW-7	08	MW-8
09	MW-10	10	MW-DUP-2
11	MW-DUP-3		

All results for soils/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the prior written approval of KEMRON.

Certified by

David L. Bumgarner

KEMRON ENVIRONMENTAL SERVICES RESULTS BY SAMPLE

This is to certify that the following samples were analyzed using good laboratory practices to show the following results.

SAMPLE ID: 02 MW-31 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.50	mg/L	05/20/97	JWR	335.1
Cyanide, Total	12	0.50	mg/L	05/14/97	JWR	335.2
Fluoride	110	2.5	mg/L	05/13/97	REB	340.2
pH (Laboratory)	9.9		s.u.	05/09/97	DJP	150.1
Specific Conductance	2500	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	0.04	0.004	mg/L	05/15/97	KHA	7060
Beryllium, Dissolved	0.0007	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.68	0.01	mg/L	05/19/97	AJS	6010A
Sodium, Dissolved	480	5	mg/L	05/19/97	AJS	6010A
Vanadium, Dissolved	0.05	0.01	mg/L	05/19/97	AJS	6010A

SAMPLE ID: 03 MW-30 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZEI	BY	METHOD
Cyanide, Total	ND	0.010	mq/L	05/14/97	JWR	335.2
Fluoride	ND	0.10	mg/L		REB	340.2
pH (Laboratory)	6.2		s.u.	05/09/97	DJP	150.1
Specific Conductance	420	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	ND	0.004	mg/L	05/15/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L		KHA	7091
Manganese, Dissolved	0.6	0.01	mg/L		AJS	6010A
Sodium, Dissolved	18	0.5	mq/L		AJS	6010A
Vanadium, Dissolved	ND	0.01	mg/L		AJS	6010A

SAMPLE ID: 04 MW-18 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.50	mg/L	05/20/97	JWR	335.1
Cyanide, Total	8.7	0.50	mg/L	05/14/97	JWR	335.2
Fluoride	200	5.0	mq/L	05/13/97	REB	340.2
pH (Laboratory)	9.7		s.v.	05/09/97	DJP	150.1
Specific Conductance	4000	1	umho/cm	05/12/97	RJS	120.1
Arsenic, Dissolved	0.078	0.008	mg/L	05/15/97	KHA	7060
Beryllium, Dissolved	0.0009	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.29	0.01	mg/L		AJS	6010A
Sodium, Dissolved	1100	10	mg/L	05/19/97	AJS	6010A
Vanadium, Dissolved	0.02	0.01	mg/L		AJS	6010A

SAMPLE ID: 05 MW-2 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl Cyanide, Total	ND 17	1.0		05/20/97 05/14/97		
Fluoride pH (Laboratory)	63 10.1	5.0	mg/L	05/13/97 05/09/97	REB	340.2

NOTES AND DEFINITIONS:

SAMPLE ID: 05 MW-2 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Specific Conductance	2100	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	0.092	0.008	mg/L	05/15/97	KHA	7060
Beryllium, Dissolved	0.001	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	1	0.01			AJS	6010A
Sodium, Dissolved	470	5	mg/L	05/19/97	AJS	6010A
Vanadium, Dissolved	0.06	0.01	mg/L		AJS	6010A

SAMPLE ID: 06 MW-5 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Amenable to Cl	ND	0.25	mg/L	05/20/97	JWR	335.1
Cyanide, Total	3.5	0.25	mg/L	05/14/97	ĴWR	335.2
Fluoride	16	0.50	mg/L		REB	340.2
pH (Laboratory)	9.0		s.u.	05/09/97	DJP	150.1
Specific Conductance	1500	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	0.015	0.004	mg/L	05/15/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	0.4	0.01	mg/L	05/19/97	AJS	6010A
Sodium, Dissolved	310	5	mg/L		AJS	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/19/97	AJS	6010A

SAMPLE ID: 07 MW-7 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Total	ND	0.010	mq/L	05/14/97	JWR	335.2
Fluoride	0.10	0.10	mg/L			340.2
pH (Laboratory)	5.6		s.v.		DJP	150.1
Specific Conductance	790	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	0.038	0.004	mg/L	05/15/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mq/L		KHA	7091
Manganese, Dissolved	2.2	0.01	mg/L		AJS	6010A
Sodium, Dissolved	89	0.5	mg/L			6010A
Vanadium, Dissolved	ND	0.01			AJS	6010A

SAMPLE ID: 08 MW-8 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	ВУ	метнор
Cyanide, Amenable to Cl	ND	0.010	mg/L	05/20/97	JWR	335.1
Cyanide, Total	0.040	0.010	mq/L		JWR	335.2
Fluoride	2.2	0.10	mg/L	05/13/97	REB	340.2
pH (Laboratory)	7.8		s.Ū.	05/09/97	DJP	150.1
Specific Conductance	560	1	umho/cm		DJP	120.1
Arsenic, Dissolved	ND	0.004	mq/L		KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L		KHA	7091
Manganese, Dissolved	0.12	0.01	mg/L	05/19/97	AJS	6010A
Sodium, Dissolved	44	0.5	mg/L			6010A
Vanadium, Dissolved	ND	0.01	mg/L			6010A

™OTES AND DEFINITIONS:

SAMPLE ID: 09 MW-10 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/14/97	JWR	335.2
Fluoride	0.70	0.10	mg/L	05/20/97	SCM	340.2
pH (Laboratory)	7.2		s.u.	05/09/97	DJP	150.1
Specific Conductance	670	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	ND	0.004	mq/L	05/15/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	ND	0.01	mg/L	05/19/97	AJS	6010A
Sodium, Dissolved	25	0.5	mg/L	05/19/97	AJS	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/19/97	AJS	6010A

SAMPLE ID: 10 MW-DUP-2 Collected: 05/08/97 Category: Water

TEST DESCRIPTION	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED	BY	METHOD
Cyanide, Total	ND	0.010	mg/L	05/14/97	JWR	335.2
Fluoride	0.20	0.10	mg/L	05/20/97	SCM	340.2
pH (Laboratory)	5.7		S.U.	05/09/97	DJP	150.1
Specific Conductance	800	1	umho/cm	05/13/97	DJP	120.1
Arsenic, Dissolved	0.038	0.004	mq/L	05/15/97	KHA	7060
Beryllium, Dissolved	ND	0.0005	mg/L	05/27/97	KHA	7091
Manganese, Dissolved	2.2	0.01	mg/L	05/19/97	AJS	6010A
Sodium, Dissolved	84	0.5	mq/L	05/19/97	AJS	6010A
Vanadium, Dissolved	ND	0.01	mg/L	05/19/97	AJS	6010A

SAMPLE ID: 11 MW-DUP-3 Collected: 05/08/97 Category: Water

RESULT	REPORTING LIMIT	UNITS	DATE ANALYZEI) BY	METHOD
6.2	0.25	mq/L	05/14/97	JWR	335.2
93	5.0	mq/L	05/13/97	REB	340.2
9.9		s.u.	05/09/97	DJP	150.1
2500	1	umho/cm	05/13/97	DJP	120.1
0.038	0.004	mg/L		KHA	7060
0.0008	0.0005			KHA	7091
0.74	0.01			AJS	6010A
480	5			AJS	6010A
0.05	0.01	mg/L		AJS	6010A
	6.2 93 9.9 2500 0.038 0.0008 0.74	RESULT LIMIT 6.2 0.25 93 5.0 9.9 2500 1 0.038 0.004 0.0008 0.0005 0.74 0.01 480 5	RESULT LIMIT UNITS 6.2 0.25 mg/L 93 5.0 mg/L 9.9 S.U. 2500 1 umho/cm 0.038 0.004 mg/L 0.0008 0.0005 mg/L 0.74 0.01 mg/L 480 5 mg/L	RESULT LIMIT UNITS ANALYZEI 6.2 0.25 mg/L 05/14/97 93 5.0 mg/L 05/13/97 9.9 S.U. 05/09/97 2500 1 umho/cm 05/13/97 0.038 0.004 mg/L 05/15/97 0.0008 0.0005 mg/L 05/27/97 0.74 0.01 mg/L 05/19/97 480 5 mg/L 05/19/97	RESULT LIMIT UNITS ANALYZED BY 6.2 0.25 mg/L 05/14/97 JWR 93 5.0 mg/L 05/13/97 REB 9.9 S.U. 05/09/97 DJP 2500 1 umho/cm 05/13/97 DJP 0.038 0.004 mg/L 05/15/97 KHA 0.0008 0.0005 mg/L 05/27/97 KHA 0.74 0.01 mg/L 05/19/97 AJS 480 5 mg/L 05/19/97 AJS

NOTES AND DEFINITIONS:

KEMRON ENVIRONMENTAL SERVICES **TEST RESULTS BY SAMPLE**

Page 5

Test Code: **826-SPE-VO**Sample Description: **TRIP BLANK #1**Test Description: **Special List - 8260**

Lab No: 01

Collected: 05/08/97

Category: Water Method: 8260A

Analyst: SLT

Instrument: HPMS1

Injected: 05/14/97

File: 10R21326

Factor: 1

Units: ug/L

			R	REPORTING
CAS	#	COMPOUND	RESULT	LIMIT
CASt	r	COMPOUND	KESULI	LHYL

127-18-4

Tetrachloroethene

ND

5

SURROGATES:

Dibromofluoromethane	<u>103</u>	ક	Recovery	(86%	- 118%)
1,2-Dichloroethane-d4	110	웅	Recovery	(80%	- 120%)
Toluene-d8	101	ક	Recovery	(888	- 110왕)
p-Bromofluorobenzene	100	કૃ	Recovery	(86%	- 115%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

KEMRON ENVIRONMENTAL SERVICES **TEST RESULTS BY SAMPLE**

Page 6

Test Code: 826-SPE-VO

Sample Description: MW-31

Lab No: 02

Collected: 05/08/97

Category: Water Method: 8260A

Test Description: Special List - 8260

File: 10R21327

Analyst: SLT Instrument: HPMS1

Injected: 05/14/97

Factor: 1

Units: ug/L

REPORTING RESULT CAS# **COMPOUND** LIMIT

127-18-4

Tetrachloroethene

28

SURROGATES:

105 % Recovery (86% - 118%) 109 % Recovery (80% - 120%) Dibromofluoromethane 1,2-Dichloroethane-d4 109 % Recovery (88% - 110%) 105 % Recovery (86% - 115%) Toluene-d8 p-Bromofluorobenzene

KEMRON ENVIRONMENTAL SERVICES **TEST RESULTS BY SAMPLE**

Page 7

Test Code: 826-SPE-VO

Lab No: 03

Collected: 05/08/97

Category: Water Method: 8260A

Sample Description: MW-30
Test Description: Special List - 8260

File: 10R21414

Analyst: SLT Instrument: HPMS1

Injected: 05/19/97

Factor: 1

Units: ug/L

REPORTING CAS# **COMPOUND**

RESULT

LIMIT

127-18-4

Tetrachloroethene

5

SURROGATES:

Dibromofluoromethane (86% - 118%) 92.4 % Recovery 90.7 % Recovery (80% - 120%) 1,2-Dichloroethane-d4 102 % Recovery (88% - 110%)
94.5 % Recovery (86% - 115%) Toluene-d8 p-Bromofluorobenzene

KEMRON ENVIRONMENTAL SERVICES **TEST RESULTS BY SAMPLE**

Page 8

Test Code: 826-SPE-VO

Sample Description: MW-18
Test Description: Special List - 8260

Lab No: 04

Collected: 05/08/97

Category: Water Method: 8260A

Analyst: MDA

Instrument: HPMS2

Injected: 05/20/97

File: 20R16749

Factor: 1

Units: ug/L

REPORTING

CAS#

COMPOUND

RESULT

LIMIT

127-18-4

Tetrachloroethene

5

SURROGATES:

Dibromofluoromethane 1,2-Dichloroethane-d4 Toluene-d8 p-Bromofluorobenzene

105 % Recovery (86% - 118%) 98.6 % Recovery (80% - 120%)
98.7 % Recovery (88% - 110%)
108 % Recovery (86% - 115%)

KEMRON ENVIRONMENTAL SERVICES **TEST RESULTS BY SAMPLE**

Page 9

Test Code: 826-SPE-VO

Sample Description: MW-2
Test Description: Special List - 8260

Lab No: 05

Collected: 05/08/97 Category: Water Method: 8260A

Analyst: SLT Instrument: HPMS1

Injected: 05/19/97

File: 10R21416

Factor: 1

Units: ug/L

REPORTING

CAS#

COMPOUND

RESULT

LIMIT

127-18-4

Tetrachloroethene

SURROGATES:

Dibromofluoromethane	90.4	용	Recovery	(86%	_	118%)
1,2-Dichloroethane-d4	90.9	왕	Recovery	(80%	-	120%)
Toluene-d8	106	ક	Recovery	(88%)	_	110%)
p-Bromofluorobenzene	<u>95.4</u>	ક	Recovery	(86%	-	115%)

KEMRON ENVIRONMENTAL SERVICES **TEST RESULTS BY SAMPLE**

Page 10

Test Code: 826-SPE-VO

Sample Description: MW-5
Test Description: Special List - 8260

Lab No: 06

Collected: 05/08/97

Category: Water Method: 8260A

Analyst: SLT

Instrument: HPMS1

Injected: 05/19/97

File: 10R21417

Factor: 1

Units: ug/L

CAS#

COMPOUND

RESULT

REPORTING LIMIT

127-18-4

Tetrachloroethene

ND

5

SURROGATES:

Dibromofluoromethane	91.5	왕	Recovery	(86%	_	118%)
1,2-Dichloroethane-d4	92.2	왕	Recovery	(80%	-	120%)
Toluene-d8	104	ક	Recovery	(888)	-	110%)
p-Bromofluorobenzene			Recovery			

NOTES AND DEFINITIONS FOR THIS SAMPLE:

KEMRON ENVIRONMENTAL SERVICES **TEST RESULTS BY SAMPLE**

Page 11

Test Code: **826-SPE-VO**Sample Description: **MW-DUP-3**Test Description: **Special List - 8260**

Lab No: 11

Collected: 05/08/97

Category: Water
Method: 8260A

Analyst: SLT Instrument: HPMS1

File: 10R21418

Injected: 05/19/97 Factor: 1 Units: ug/L

REPORTING

CAS#

COMPOUND

RESULT

LIMIT

127-18-4

Tetrachloroethene

SURROGATES:

Dibromofluoromethane 89.4 % Recovery (86% - 118%) 88.9 % Recovery (80% - 120%)
103 % Recovery (88% - 110%) 1,2-Dichloroethane-d4 Toluene-d8 p-Bromofluorobenzene 92 % Recovery (86% - 115%)



CHAIN - OF - CUSTODY RECORD

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Trip Blank#1	5-8-37	7	2	pule								C
MW-31	-	_	R			_						\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
MW-30			8	_	_	_) [
MW-18			6	-	_	-	-					
MW-3			8	_	1	_						\ \ \
MW-5			ره	_	_	-) \
MW-7				_		7) ^
MW-8						-	-					2 %
MW-10					-	, ~						7 ~
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MW-DUO-3	>	>	7	-	,	. - -	-					1
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Sample Code: L = Liquid; S = Solid; A = Air	Liquid; S = Solid;	A = Air						-	 	otal Number o	Total Number of Containers:	hh
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APPENDIX B-2

LABORATORY ANALYTICAL REPORT FOR MAY 1998 MONITORING EVENT



KEMRON Envia dental Services 109 Starlite Park Marietta, Ohio 45750 Phone: (614) 373-4071

Ormet Corporation Hydrosystems Management Inc. 331 S. Main Street, Suite 109 Washington, PA 15301 Attention: Bob Fargo

Login #: L9805079
Report Date: 05/21/98
Work ID: HM003.07/ORMET/HANNIBAL, OH
Date Received: 05/05/98

PO Number: Account Number: ORMET-086

SAMPLE IDENTIFICATION

Sample Sample Number Description	L9805079-02 MW-19 L9805079-04 MW-32D L9805079-06 MW-37 L9805079-08 MW-8 L9805079-10 MW-7 L9805079-14 MW-11D L9805079-14 MW-28 L9805079-16 MW-39D
Sample Description	MW-15 MW-32 MW-35 MW-41 MW-10 MW-11 MW-40D MW-39S
Sample Number	L9805079-01 L9805079-03 L9805079-05 L9805079-07 L9805079-11 L9805079-11 L9805079-11

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

Deanna Hesson

	ЮН
L9805079-01 MW-15	
	ID:
Lab Sample ID: Client Sample ID:	Site/Work II

Matrix: Water Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Result Qualiflers	RL Dil	Туре	Analyst	Analysis Date	Time M	Method
Cyanide, Total	mg/L mg/L umho/cm mg/L S.U.	0.49 0.02 610 0.40 6.99	0.02 0.01 1.0 0.10 1.0	AKK/NN AKKKK	JWR JWR MAR DIN SJM	05/07/98 05/18/98 05/11/98 05/07/98	(335.4\9010 335.1 120.1 340.2
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved Vanadium, Dissolved	mg/L mg/L mg/L mg/L	ND ND ND AD ND	0.0041 0.00051 0.01 1 0.50 1	NXRXR -//	OYH CYH KHA KHA	5/12/9 5/11/9 5/11/9	00000	

Lab Sample ID: L9805079-02 Client Sample ID: MW-19 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Regult	Qualifiers	RL	D11	Type	Analyst	Analysis Date	Time Method
Cyanide, Total Specific Conductance Fluoride	mg/L umho/cm mg/L s.U.	560 1.4 7.23	GN 3	0.01 1.0 0.10 1.0		A/N A/N A/N	JWR MAR DIN SJM	05/07/98 05/11/98 05/07/98	09:00 335.4\9010 15:40 120.1 13:00 340.2
Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/L mg/L mg/L mg/L	1 3		0.008 2 0.0005 1 0.01 1 0.50 1		R-2 N/A N/A	KHA JYH KHA KHA KHA	11123	:41 6010 :40 6010 :01 6010 :01 6010

Page 2 of 10

		ЮН
		HANNIBAL,
L9805079-03	MW-32	IM003.07/ORMET
i ii		
Ψ.	Client Sample	Site/Work

COC Info: N/A

Matrix: Water Collected: 05/04/98 N/A

Analyte	Units	Result Qualifiers	RL Dil	Type	Analyst	Analysis Date	Time Method
Cyanide, Total. Cyanide, Amenable to Ci Specific Conductance. Fluoride. Arsenic, Dissolved. Beryllium, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/L mg/L umho/cm mg/L mg/L mg/L mg/L	2.5 0.34 630 7.7 8.03 ND ND 1.9	010 100 100 100 100 100 100 100 100 100	NNNNN NNRRR 44444 44722		05/07/98 05/11/98 05/11/98 05/06/98 05/12/98 05/11/98 05/11/98	

Lab Sample ID: L9805079-04
Client Sample ID: MW-32D
Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Туре	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L mg/L umho/cm mg/L S.U.	2.5 0.09 690.09 8.0	2 6	0.10 0.01 1.0 0.10	0	NNNN AAAA		05/07/98 05/18/98 05/11/98 05/07/98	00000	335.4\9010 335.1 120.1 340.2
Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodlum, Dissolved Vanadium, Dissolved	1/6w 17/6w 17/6w 17/6w 17/6w	2.0		0.004 0.0005 0.01 0.50	ਜ਼ਜ਼ਜ਼ਜ਼ ਜ਼ਜ਼ਜ਼ਜ਼		JYH JYH KHA KHA KHA	11122	000022	. 00000

Page 3 of 10

COC Info: N/A

Matrix: Water Collected: 05/04/98 N/A

Page 4 of 10

	ЮН
Sample ID: L9805079-05 Sample ID: MW-35	HM003.07/ORMET/HANNIBAL,
	Ξ.
ole I	ork I
Lab Sam Lient Sam	Site/W
CJ	ł

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time Method
Cyanide, Total Cyanide, Amenable to Cl Specific Conductance. Fluoride Arsenic, Dissolved Beryllium, Dissolved Sodium, Dissolved	mg/L nmg/L nmg/L s.U. mg/L mg/L mg/L mg/L	15 2.9 710 27 8.93 0.012 140 0.92	ND ND	0.50 0.01 0.50 0.50 0.004 0.001 0.50	0	NNNN NNNN R-222PP PAPP	JWR JWR MARR MARR DIJN SJW JYH KHA KHA KHA	05/07/98 05/11/98 05/11/98 05/05/98 05/12/98 05/12/98 05/11/98 05/11/98	00000 00444

Lab Sample ID: L9805079-06 Client Sample ID: MW-37 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/04/98 N/A

Analyte	Unita	Result	Qualifiers	RĽ	Dil	Туре	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L mg/L umho/cm mg/L s.U.	530 857	M GN	0.50 0.01 1.0 0.10	0	NNNN AAAA	JWR JWR MAR DIN SJM	05/07/98 05/18/98 05/11/98 05/07/98	100000
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved Vanadium, Dissolved	1/5m 1/5m 1/5m 1/5m 1/6m	0.018 0.28 120 0.02	18 ND 8	0.004 0.0005 0.01 0.50 0.50	ਜਰਜਰਜ	NNRNA A4022	JYH JYH KHA KHA KHA	11111	38 6010 38 6010 01 6010 01 6010

Lab Sample ID: L9805079-07 Client Sample ID: MW-41 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/04/98 N/A

COC Info: N/A

Analyte	Units	Result Qualifiers	RL D41	Type	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L umho/cm mg/L s.U.	420 ND 0.30 6.67	0.01 1.0 0.10 1	A/N A/N A/A	JWR MAR DLN SJM	05/07/98 05/11/98 05/07/98 05/06/98	09:00 335.4\9010 15:40 120:1 13:00 340:2 15:15 150:1
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved Vanadium, Dissolved	7/5w 7/5w 7/5w 7/5w 7/5w	0.016 ND 1.3 ND	0.0004 1 0.0005 1 0.01 1 0.50 1	N/ RR R - 2 2 - 2 2 - 2	JYH JYH KHA KHA	77777	:43 6010 :43 6010 :01 6010 :01 6010

Lab Sample ID: L9805079-08 Client Sample ID: MW-8 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/05/98 N/A

Analyte	Units	Result	Qualifiers	RL	110	Type	Analyst	Analysis Date	Time Method	ğ
Cyanide, Total	mg/L mg/L	0.02	Z MD			N/A	JWR	6/10/	:00 33	1/9010
Specific Conductance	umho/cm	490	•	1.0.1		N/A	MAR	/13/9/	:00 335 :40 120	-1 - 1
······································	mg/t s.u.	7.81	H	0.10 1		A/N	DI.N SJM	05/07/98 05/06/98	13:00 340.2	0.0
Arsenic, Dissolved			QN			N/A	JYH	/12/9	:47 601	m
Manganet Dissolved	7/5m 1/5m	0.14	_	0.0005 1		N/A R-2	JYH KHA	05/12/98 05/11/98	12:47 6010B	. m m
Vanadium, Dissolved		30	-			R-2	KHA	/11/9	:01 601	m
			מא			R-2	KHA	/11/9	:01 601	m

Lab Sample ID: L9805079-Client Sample ID: MW-10 Site/Work ID: HM003.07/

Analyte	Units	Result Qualifiers	RL Dil	Type	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L mg/L umbo/cm mg/L s.u.	0.15 0.01 970 0.60 7.22	0.01 0.01 1.0 0.10 1	AA/NN/	JWR JWR DLN SIM	05/07/98 05/119/98 05/11/98 05/07/98	10000
Arsenic, Dissolved. Beryllium, Dissolved. Manganes, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/r mg/r mg/r mg/r mg/r	ND ND ND ND 120	0.008 2 0.0005 1 0.01 1 0.50 1		KHA JYH KHA KHA KHA	60000	:45 6010 :18 6010 :01 6010 :01 6010 :01 6010
Lab Sample ID: L9805079-10 Client Sample ID: MW-7 Site/Work ID: HW03 07/00MEm/HANNITERED	+ a CTTANA ETT/		Matrix: Water Collected: 05/05/98	N/A	000	COC Info: N/A	or the state of th

Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

]
Analyte	Units	Result Qua	Qualifiers	RĽ	170	Type	Analyst	Analysis Date	Time Method	
Cyanide, Total. Specific Conductance. Fluoride. PH Arsenic, Dissolved. Beryllium, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/L umho/cm mg/L s.U. mg/L mg/L mg/L	770 0.20 5.71 0.051 2.2	ON ON ON	0.01 1.00 1.00 1.00 1.00 1.0000 1.000 1.000 1.000 1.000 1.000 1.0000 1.000 1.000 1.0000 1.000 1.0000 1.000 1.000 1.000 1.0000 1.000 1.000 1.000 1.000 1.000		NNNN NNRR 4444 446222	JWR MAR DLN SJM JYH JYH KHA KHA	05/07/98 05/11/98 05/07/98 05/06/98 05/12/98 05/11/98 05/11/98		010

Lab Sample ID: L9805079-11 Client Sample ID: MW-11 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time Met	Method
Cyanide, Total	mg/L mg/L umho/cm mg/L S.U.	0.02 490 1.7 7.84	QN CN	0.01 10.00 1.00 1.00 1.00 1.00 1.00 1.0		AVNN A	JWR JWR MAR DLN SJM	05/07/98 05/19/98 05/11/98 05/07/98	00000	.4\9010
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved	mg/r mg/r mg/r mg/r mg/r	0.45	ON ON ON	0.004 0.005 0.01 0.50 0.50	ਜਜਜਜ	R-22 R-22 R-22	JYH JYH KHA KHA KHA	5 (2) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	:27 60 :27 60 :01 60 :01 60	
								H		

Lab Sample ID: L9805079-12 Client Sample ID: MW-11D Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/05/98 N/A

Analyte	Unite	Result	Qualifiers	RL	DII	Type	Analyst	Analysis Date	Time M	Method
Cyanide, Total	mg/L mg/L umho/cm mg/L s.U.	0.02 500 1.7 7.85	GN 10	0.01 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0		AAAAA	JWR JWR MAR DLN S.TM	05/07/98 05/15/98 05/15/98 05/05/98	100000	335.4\9010 335.1 120.1 340.2
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved	mg/r mg/r mg/r mg/r mg/r	0.43	GN GN	0.004 1 0.0005 1 0.01 1 0.50 1		RAZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ	OYH VYH KHA KHA	55/11/99 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		6010B 6010B 6010B 6010B 6010B

Lab Sample ID: L9805079-13 Client Sample ID: MW-1 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Result Qualifiers	RL Dil	1 Type	Analyst	Analysis Date	Time Method
Cyanide, Totalspecific ConductanceFluoridepH	mg/L umho/cm mg/L S.U.	480 0.20 6.01	0.01 1.0 1.0 1.0	NNN	JWR MAR DI.N SJM	05/07/98 05/15/98 05/07/98	
Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/r mg/r mg/r mg/r mg/r	ND ND 0.10 20 ND	0.0041 0.00051 0.01 0.50	N/A N/A R-2 R-2	JYH JYH KHA KHA	77777	36 6010 36 6010 01 6010 01 6010
	·						

Lab Sample ID: L9805079-14 Client Sample ID: MW-28 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/05/98 N/A

Analyte	Units	Result Qualifiers	alifiers	RL	110	Туре	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L mg/L	0.12	EN CEN	1		1	JWR	2/01/	000
Specific Conductance	umho/cm	500	1	1.0.1		ZZ ZZ	MAR	5/15/	:00 335
······ Hd	mg/r s.u.s	0.20 5.74		0.10 1		A/N	NIO MES	05/07/98 05/06/98	13:00 340.2
Arsenic, Dissolved			QN			a/N	<u> </u>	/22/	207 17.
Beryllium, Dissolved	mg/L mg/L	6	NO ON	0.0005 1		N/N	H.Y.	05/12/98	13:41 6010B
Sodium, Dissolved.		65.01	ļ			ス ス 4 04	KHA	$\frac{11}{11}$:01 601
Variadium, Dissolved			2			R-2	KHA	/11/	0:01 601

Lab Sample ID: L9805079-15 Client Sample ID: MW-40D Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/05/98 N/A

COC Info: N/A

Analyte	Units	Regult Qualifiers	RL D11	Type	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L mg/L umho/cm mg/L s.U.	0.49 0.47 1300 19 7.85	0.02 1.0 1.0 0.50 1.50	AKKNNN AKKAKA	CWR CWR MAR DIN	05/07/98 05/19/98 05/15/98 05/07/98	00000
Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/L mg/L mg/L mg/L	ND ND 250.36 ND	0.004 0.0051 0.005 0.50 1.0005 0.01	RR-2 N/A	кну кну кну кну	7 7777	3:45 6010 3:45 6010 3:45 6010 3:45 6010 0:01 6010

Lab Sample ID: L9805079-16 Client Sample ID: MW-40S Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/05/98 N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L mg/L umho/cm mg/L S.U.	0.36 1400 39 8.20	EN CHARLES	0.02 20.01 11.00 11		AAAA	JWR JWR MAR DLN	05/07/98 05/19/98 05/15/98 05/07/98	0000
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved		270 270		0.004 1 0.0005 1 0.01 1 0.50 1		N X X X X X X X X X X X X X X X X X X X	SUM CYTH CYTH KHA KHA	5/06/9 5/12/9 5/11/9 5/11/9	

COC Info: N/A

Matrix: Water Collected: 05/05/98 N/A

Lab Sample ID: L9805079-17 Client Sample ID: MW-39S Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total. Cyanide, Amenable to Cl Specific Conductance. Fluoride. PH Arsenic, Dissolved. Beryllium, Dissolved. Manganes, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/L umho/cm mg/L s.U. mg/L mg/L mg/L mg/L	2.3 4000 98 9.04 0.009 700	CN CN 60	0.10 0.01 2.5 2.5 0.004 0.0005 0.50	1111111	NNNN ARNAN AAAAA 2244A	1	05/07/98 05/15/98 05/15/98 05/06/98 05/12/98 05/12/98 05/11/98 05/11/98	09:00 13:15 13:00 13:54 13:54 10:01	335.4\9010 335.1 120.1 150.1 150.1 6010B 6010B 6010B 6010B

Lab Sample ID: L9805079-18 Client Sample ID: MW-39D Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/05/98 N/A

					:				
Analyte	Unites	Regule Q	Qualifiers	RL	Dil	Тура	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L mg/L umho/cm mg/L s.U.	590 3.6 7.52	NO ON	0.01		AAAAA	1	05/07/98 05/19/98 05/15/98 05/07/98	
Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	1/5w 1/5w 1/5w 1/5w 1/5w	34.77	ON ON ON	0.004 0.005 1.000 0.50 1.000		NRN -22 N-24 A-24	JYH JYH JYH KHA KHA	5 12 9 5 11 9 5 11 9 5 11 9 5 11 9	.58 60 .01 60 .58 60 .01 60



CHAIN - OF - CUSTODY RECORD

Project Number Project Name/Location	Project Name/Local	tion				Container D	Description/ N	Number of Containers	ners			
	Ormet/Hamibal	م	-	(2)	/							
HM003.07			1/2.016 1/2.016	lestic hamel	ندعة ال مهلما	1 /4 /4 / 1 / 4 / 4 / 4 / 4 / 4 / 4 / 4	` _					
Sampling Personnel	4		מים ל ד	1+1 U-	11	19						
J Campbell	, S Menosky		ds!	1M Tote	100/ 1 m 8 es	215	· · 					
Sample ID	Date/Time	Sample	Hd 1988	<u>क्</u> र	005	- FONH						1,440,4
MW-15	5-4-98	7										101AL
MW-19	_		_	_	-)~
MW-32				_	-) ~
MW-32d			_									
MW-35			_	_								7
Mw-37	>		-	-								7
12-3m	5-4-98		-	_	-						-	PY .
M-8	5-5-38		-	-								(1)
ML2-10												n
MW-7				-	_							7
MW-11			-	-	-							100
MW-110			-	-	_) ~
MW-I			_	_	-							2
MW-28			_	_) (
Mw-40a	>	>	1	_)n
Sample Code: L = Líquid; S ≈ Solid; A = Air	iquid; S = Solid;	A = Air							To	tal Number o	Total Number of Containers:	45
Relinquished by:	MAG		Organization:	4	MI		O .	Date: 5-5-98	7 Time:			Seal Intact?
Received by:	Spare K. Wa	Sar Den	Organization:	Y	Lem FOY	ک	O	3		17:00		Yes No NA
Relinquished by:	A TOTAL	PLOUN OF	Organization:		Kemron		O	Date: 5-5-9				1 2
Hecelved by		71077	V() (Organization:	-	1K 111/		٥	Date; S- (0-4 8	X Time:	- 11		Yes No NA
REMARKS: RUM	Total Cyanide	- i	first and	j.	detecte	detectable results	Ţ	then an Amenable Ca (ASA) Story in	Amenab	P T P	100 O	Ord in
	Samples, 111	4	Coolers	5)		(<u> </u>	Dolled	Copler
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DELIVERY METHOD.	ri ncared		٥	, ac		186 - 	ろう 300	Cole Lands 1.0	50	(0		
DELIYEN WENCE.			E 53	Common Carrier	Ter	-	Lab Cor	rier Cemon		Other		



CHAIN-OF-CUSTODY RECORD

Lioject Namber	Project Name/Location		25	5	ontainer Desc	Container Description/ Number of Containers	of Containers			
HM003,07	Laboratory Kemyon	हैं अंदिश न्	lastic Amenal	t, ć N _I Na _I V GIHERA	<i>בוונערק</i>					
Sampling Personnel		d 7	* ()	w's	190					
Jampbell	_	nds w c	<u> </u>	99'sq 744 HQ	<u>.</u> 4-					
Sample ID		ale ale	or Se	4W 1 032 1 25(0	² ONH					17.404
mw-40s		1 7		_						NIOI C
MW-395										Jı
mw-39d	D		_	_						کارد
))
Code: L =	Sample Code: L = Liquid; S = Solid; A =	= Air					7	Total Number of Containers:	ntainers:	0 0
Relinquished by:	MA	Organization:		I'm H		Date:	S-5-9% Time:			Seal Intact?
Received by		Aparthan Organization:	ة: ہو	emcon		Date: F	Date: 5-5-98 Time:	17:00	প্র	Yes No NA
Relinquished by:	Cone K. U. O. Organization:	Organizatio	n: X	Kemran	٧ ک	Date:		1		Ü
neceived by:	שבני שוו ושבי	Organizatio	n: 1) 4	mr.oc		Date:	Date: O-(0 - 1 X Time:	SOO		Yes No NA
RKS: RUM	REMARKS: Run Total Cn First and if detectable results then	nd if clet	ectable	result.	s then	run Ame	i run Amenable Cu	TO DE	040	OSP GOOD ON
					7000	-chtal	1012) 	Chad	न् एक (ह
				}		XX	3,0	3 N. C		
DELIVERY METHOD:	In Person	Con	Common Carrier			Lab Courier Kemron	Convon	Other		



KEMRON Envir. antal Services 109 Starlite Park Marietta, Ohio 45750 Phone: (614) 373-4071

Ormet Corporation Hydrosystems Management Inc. 331 S. Main Street, Suite 109 Washington, PA 15301 Attention: Bob Fargo

Login #: L9805118
Report Date: 05/21/98
Work ID: HM003.07/ORMET/HANNIBAL, OH
Date Received: 05/06/98

PO Number: Account Number: ORMET-086

SAMPLE IDENTIFICATION

e Sample Pescription	L9805118-02 NW-5 L9805118-04 NW-18 L9805118-06 NW-31 L9805118-08 NW-12 L9805118-10 NW-42D
Sample Description	222122
Sample Number	L9805118-01 L9805118-03 L9805118-05 L9805118-07 L9805118-09 L9805118-11

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH ELAP ID: 10861

Certified By David L. Bumgarner

L9805118-01 MW-2 HM003.07/ORMET/HANNIBAL, OH Lab Sample ID: Client Sample ID: Site/Work ID:

Matrix: Water Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total Cyanide, Amenable to Cl Specific Conductance Fluoride Arsenic, Dissolved Beryllium, Dissolved Sodlum, Dissolved Vanadium, Dissolved	mg/L mg/L umho/cm mg/L mg/L mg/L mg/L	13 1900 68 9.98 0.082 0.001 450 0.93	ND ND 32 2 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.50 0.01 1.0 1.0 1.0 0.004 0.0005 0.01		NNNN NNNN 44444 44722	T Company of the Comp	05/14/98 05/11/98 05/11/98 05/15/98 05/12/98 05/12/98 05/11/98 05/11/98		335.4\9010 335.1 120.1 340.2 150.1 6010B 6010B 6010B 6010B

Sample Weight: N/A Extract Volume: N/A	% Solid: N/A	Method: 8260B Run ID: R46428
Dil. Type: N/A COC Info: N/A	Date Collected: 05/06/98	Instrument: HPMS8 Analyst: JLH Lab File ID: 8HY01924
Lab Sample ID: L9805118-01 Client Sample ID: MW-2 Site/Work ID: HM003.07/ORMET/HANNIBAL. OH	Matrix: Water	TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 05/14/98 Time: 20:13

Product: 826-SPE-VO - Special List - 8260

Compound

127-18-4 CAS #

Qualifiers 5.3 Result 105 101 101 109 Units ng/I SURROGATES - In Percent Recovery:

Dibromofluoromethane.

1,2-Dichloroethane-d4.

Toluene-d8.

p-Bromofluorobenzene. Tetrachloroethene......

Dilution

5.0 RL

110%)

RL - Reporting Limit

3		
1		
,		
7		

Lab Sample ID: L9805118-02 Client Sample ID: MW-5 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/06/98 N/A

Analyte	Units	Result Qu	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total. Cyanide, Amenable to Cl Specific Conductance. Fluoride. Arsenic, Dissolved. Beryllium, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/r mg/r umho/cm mg/r s.u. mg/r mg/r mg/r	2.1 1400 18 8.83 0.007 300.17		0.10 0.01 1.0 0.50 0.0005 0.001 0.50	0 ਜਜਦਾਨਰ ਜਜਦਾਰ	NNNN NNNN 44444 447	JWR JWR MARR MARR SJM JYH KHA KHA KHA	05/14/98 05/11/98 05/11/98 05/15/98 05/12/98 05/11/98 05/11/98		335.4\9010 335.1 120.1 340.2 150.1 6010B 6010B 6010B

8260
1
List
Special
•
826-SPE-VO
Product:

Sample Weight: N/A Extract Volume: N/A * Solid: N/A	Method: 8260B Run ID: R46428	Qualifiers RL Dilution	5.0	118%) 120%) 110%) 115%
_		Qual	QN QN	1111 9089 8888
N/A N/A 05/06/98	HPMS8 JLH 8HY01925	Result		
Dil. Type: N/A COC Info: N/A Date Collected: 05/06/98	Instrument: Analyst: Lab File ID:	Unita	ng/L	105 104 100 111
Lab Sample ID: L9805118-02 Client Sample ID: MW-5 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH Matrix: Water	TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 05/14/98 Time: 20:47	CAS # Compound	127-18-4 Tetrachloroethene	SURROGATES - In Percent Recovery: Dibromofluoromethane

Lab Sample ID: L9805118-03 Client Sample ID: MW-5D Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total. Cyanide, Amenable to Cl Specific Conductance. Fluoride. Arsenic, Dissolved. Beryllium, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/L mg/L umho/cm mg/L s.U. mg/L mg/L mg/L	1.3 1400 8.83 0.007 300.18	3 3 07 ND 8 ND	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0		NNNN NNNN RR-22 PAPAPA	JWR JWR MAR MAR SJM JYH GYH KHA KHA	05/14/98 05/11/98 05/11/98 05/11/98 05/12/98 05/12/98 05/11/98 05/11/98	08:00 09:00 09:55 17:35 15:53 10:01 10:01	335.4\9010 335.1 120.1 150.1 150.1 6010B 6010B 6010B 6010B

Product: 826-SPE-VO - Special List - 8260

	Dil. Type: N/A COC Info: N/A	Date Collected: 05/06/98
1	Lab Sample ID: L9805118-03 Client Sample ID: MW-5D Site/Work ID: HM003.07/ORMET/HANNIBAL. OH	Matrix: Water

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/14/98 Time: 21:20

RL	5.0	
Result Qualifiers	N	86 ~ 118%) 80 ~ 120%) 88 ~ 110%) 86 ~ 115%)
Result		
Units	7/Bn	106 104 101 113
CAS # Compound	127-18-4 Tetrachloroethene	SURROGATES- In Percent Recovery: Dibromofluoromethane

Dilution

Method: 8260B Run ID: R46428

Instrument: HPMS8 Analyst: JLH Lab File ID: 8HY01926

% Solid: N/A

Sample Weight: N/A Extract Volume: N/A

Lab Sample ID: L9805118-04 Client Sample ID: MW-18 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/06/98 N/A

COC Info: N/A

Analyte	12 + +	1		1		Analysis	
		vesure Qualitiers	RL Dil	Type	Analyst	Date	Time Method
Cyanide, Total	mg/L mg/L umbo/cm mg/L	9.8 0.40 7200	0.25 25 0.01 1 1.0 1	A/N A/N	JWR JWR MAR	05/14/98 05/19/98 05/11/98	09:00 335.4\9010 08:00 335.1 09:55 120.1
на	S.U.S	9.76	o.	A/N A/A	MAR SJM	15/	.20 340. 35 150.
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved	ng/L ng/L ng/L	0.094 0.0014 0.49	0.008	A/N	HYC	/12/9 /12/9	58
Sodium, Dissolved	T/bw T/bw	1100.05	0.01	X X X 1 1 1 2 4 4	KHA	05/11/98 05/11/98 05/11/98	10:01 6010B 10:01 6010B 10:01 6010B
						j,	
Product: 826-SPE-VO - Special List -	Special List						
Lab Sample ID: L9805118-04 Client Sample ID: MW-18 Site/Work ID: HM003.07/ORMET/HANNIRAL	T. /HANNTRAI.		Type: N/A Info: N/A	-	Sample F Extract	Weight: N/A Volume: N/A	10. 10. 10. 10. 10. 10. 10. 10. 10. 10. 10.
trix:		Date	Collected: 05/06/98		%	Solid: N/A	-
TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 05/14/98 Time:	le: 21:53	Instr An Lab Fi	Instrument: HPMS8 Analyst: JLH Lab File ID: 8HY01927		24	Method: 826 Run ID: R46	8260B R46428
CAS # Compound		Units	Result	Oualifiers	8	Έ	ייין יין יין יין יין יין יין יין יין יי

Dilution

Qualifiers

Result

Units ng/I

24

107 107 100 110

SURROGATES - In Percent Recovery:
Dibromofluoromethane.
1,2-Dichloroethane-d4.
Toluene-d8.
p-Bromofluorobenzene.

Tetrachloroethene..............

127-18-4

5.0 RL

RL = Reporting Limit

Lab Sample ID: L9805118-05 Client Sample ID: MW-30 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/06/98 N/A

'A COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Lta	Type	Analyst	Analysis Date	Time Method	
Cyanide, Totalspecific ConductanceFluoridepH	mg/L umho/cm mg/L s.U.	390 0.10 6.19	ON C	0.01 1 1.0 1 0.10 1		N/N N/N A/N A/A	1	05/14/98 05/11/98 05/15/98 05/07/98	010010	9010
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved Vanadium, Dissolved	7/5w 1/5/17 1/5/17 1/5/17	0.68		0.004 1 0.0005 1 0.01 1 0.50 1		N/A N/A R-2 R-2	лун Лун КНА КНА КНА	05/12/98 05/112/98 05/11/98 05/11/98 05/11/98	** ** ** ** **	

	Sample Weight: N/A Extract Volume: N/A	% Solid: N/A	Method: 8260B Run ID: R46428
	Dil. Type: N/A COC Info: N/A	Date Collected: 05/06/98	Instrument: HPMS8 Analyst: JLH Lab File ID: RHV01928
Product: 826-SPE-VO - Special List - 8260	Lab Sample ID: L9805118-05 Client Sample ID: MW-30 Site/Work ID: HM003.07/ORMET/HANNTRAI. OH		TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 05/14/98 Time: 22:26

Dilution	1	
RL	5.0	
Qualifiers		86 - 118%) 80 - 120%) 88 - 110%) 86 - 115%)
Result	13	
Units	ng/L	108 108 112
CAS # Compound	127-18-4 Tetrachloroethene ug/L	SURROGATES- In Percent Recovery: Dibromofluoromethane. 1,2-Dichloroethane-d4. Toluene-d8. p-Bromofluorobenzene.

Login #L9865118 May 21, 1998 08:41 am

Lab Sample ID: L9805118-06 Client Sample ID: MW-31 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result Qualifiers	ers RL	D11	Туре	Analyst	Analysis Date	Time Method
Cyanide, Total. Cyanide, Amenable to Cl Specific Conductance. Fluoride. Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodium, Dissolved.	mg/r mg/r umho/cm mg/r s.U. mg/r mg/r mg/r mg/r	9.3 ND 2400 100 9.63 0.036 0.0013 1.1 490 0.04	0.50 0.01 1.0 2.0 0.004 0.0005 0.01 10.01	44 01 10 10 10 10 10 10 10 10 10 10 10 10	AGGAG AGGAG	JWR JWR MAR SJM JYH JYH JYH JYH	05/14/98 05/11/98 05/11/98 05/05/09 05/08/98 05/08/98 05/08/98 05/08/98	09:00 335.4\9010 09:55 120.1 09:55 120.1 08:20 340.2 17:35 150.1 15:37 6010B 15:37 6010B 15:37 6010B 15:37 6010B

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N/A N/A	N/A	8260E
Sample Weight: N/A Extract Volume: N/A	% Solid: N/A	Method: 8260E
Dil. Type: N/A COC Info: N/A	Date Collected: 05/06/98	Instrument: HPMS8
Lab Sample ID: L9805118-06 Client Sample ID: MW-31 Site/Work ID: HM003.07/ORMET/HANNIBAL. OH	Matrix: Water	TCLP Extract Date: N/A Extract Date: N/A

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 05/14/98 Time: 22:59

Method: 8260B Run ID: R46428

Analyst: JLH Lab File ID: 8HY01929

Dilution RI Qualifiers 880 880 86 22 Regult 107 109 102 110 Units ng/Ir SURROGATES - In Percent Recovery:

Dibromofluoromethane.

1,2-Dichloroethane-d4.

Toluene-d8.

p-Bromofluorobenzene. Tetrachloroethene...... Compound 127-18-4 CAS #

110%)

Product: 826-SPE-VO - Special List - 8260

Weight: N/A Volume: N/A	Method: 8260B Run ID: R46428	RL Dilution	5.0 1	
Sample Extract		Qualifiers	CN	(86 - 118%) (80 - 120%) (88 - 110%) (86 - 115%)
Dil. Type: N/A COC Info: N/A Date Collected: 05/06/98	Instrument: HPMS8 Analyst: JiH Lab File ID: 8HY01930	Units Result	ng/L	109 111 102 114
Lab Sample ID: L9805118-07 Client Sample ID: TRIP BLANK Site/Work ID: HM003.07/ORMET/HANNIBAL, OH Matrix: Water	TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 05/14/98 Time: 23:32		127-18-4 Tetrachloroethene	SURROGATES- In Percent Recovery: Dibromofluoromethane

Lab Sample ID: L9805118-08 Client Sample ID: MW-12 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/06/98 N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Туре	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L umho/cm mg/L S.U.	470 0.80 7.43	ND 0 3	0.01 1.0 0.10 1.0		AAAA	JWR MAR MAR S.TM	05/14/98 05/11/98 05/15/98	
Arsenic, Dissolved	1/5m 2/5m 1/5m 1/5m 1/5m	1.9	ON ON ON	0.008 2 0.0005 1 0.01 1 0.50 1		NNNN AAAAA		7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	42 601 42 601 42 601 42 601
									100 11111

Lab Sample ID: L9805118-09 Client Sample ID: MW-42S Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/06/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L mg/L umbo/cm mg/L s.U.	0.52 1400 27 8.26	2 ND	0.02 0.01 1.0 0.50	24484	NNNN AAAAA		05/14/98 05/11/98 05/11/98 05/15/98	00000	335.4\9010 335.1 120.1 340.2
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved Vanadium, Dissolved	mg/L mg/L mg/L mg/L	270	ND ND T ND ND	0.00 0.00 0.00 0.00 0.00	਼ ਰਜ਼ਰਜ਼ਜ਼	NNNN	7YH 7YH 7YH 7YH 7YH	5008/9 2008/9 2008/9 2008/9		6010B 6010B 6010B 6010B 6010B

Lab Sample ID: L9805118-10 Client Sample ID: MW-42D Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/06/98 N/A

Analyte	Units	Result Q	Qualifiers	RL	D1.1	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total		0.07		0.01 1		A/N A/N	JWR	5/14/9	000	335.4\9010
Specific ConductanceFluoride	umbo/cm mg/L	550		1.0 0.10		A/N	MAR	05/11/98 05/11/98 05/15/98	000	340.1 340.1
Arsenic, Dissolved		7.04	g			N/A		5/07/9	32	0
Beryllium, Dissolved	mg/L		2 S	0.0005		ZZ ZZ ZZ	H H	05/08/98 05/08/98	15:51	6010B 6010B
Sodium, Dissolved.		26.2	!			· ·	HAL CASH	5/08/9 5/08/9	5.57	100
·····						•	JYH	5/08/9	5:51	01

Login #L9805118 May 21, 1998 08:41 am

Lab Sample ID: L9805118-11 Client Sample ID: MW-16 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/06/98 N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time Method	ਾਹ ਹ
Cyanide, Total	mg/L mg/L umho/cm mg/L S.U.	2.0 0.40 750 111		0.05 0.01 1.0 0.50	244	NNNN 4444	JWR JWR MAR MAR SJM	05/14/98 05/19/98 05/11/98 05/15/98 05/07/98	09:00 335.4 08:00 335.1 09:55 120.1 09:30 340.2 17:35 150.1	\9010
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved	mg/r mg/r mg/r mg/r mg/r	1.2		0.004 0.0005 0.01 0.50	ਰਜਜਜਜ	ZZZZZ ZZZZZ	HYU HYU HYU HYU	05/08/98 05/08/98 05/08/98 05/08/98	15:55 6010B 15:55 6010B 15:55 6010B 15:55 6010B 15:55 6010B	



CHAIN - OF - CUSTODY RECORD

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	of Containers														Total Number of Containers:	:: 5/6/9 K Time: 1600	5/6/98 Time: 1	15x6-98 Time: /	5/6/98	1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	C FAIR I	
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Project Name/Location	Lemvon Sample S	Code	5-6-78				-		-						= Liquid; S = Solid; A = Air	Manization:	While Make Organization:	Charl Why Organization:	CIJOR (MONTONIZATION:			
Project Number	lonn	Sample ID	MU-3	MW-54	MW-18	MW-30	MW-31	Trip Blank	mジーは	MW-425	mw-4ad	mw-16			Sample Code: L = Li	Relinquished by:	Received by:	Relinquished by:	Received by:	REMARKS:		

Other

Lab Courier Kommon

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In Person

DELIVERY METHOD;



KEMRON Envir. Intal Services 109 Stariite Park Marietta, Ohio 45750 Phone: (614) 373-4071

Ormet Corporation Hydrosystems Management Inc. 331 S. Main Street, Suite 109 Washington, PA 15301 Attention: Bob Fargo

Login #: L9805144
Report Date: 05/21/98
Work ID: HM003.07/ORMET/HANNIBAL, OH
Date Received: 05/07/98

PO Number: Account Number: ORMET-086

SAMPLE IDENTIFICATION

Sample Description	22
	L9805144-02 L9805144-04
Sample Description	
Sample Number	L9805144-01 L9805144-03 L9805144-05

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

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Deanna Hesson

fay 21, 1998 04:53 pm

	MW-34D	
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Sample	Client Sample	e/Work
Lab	Client	S

e/Work ID: HM003.07/ORMET/HANNIBAL, OH

COC Info: N/A

Analyte	Units	Result Qualifiers	RL D11	Type	Analyst	Analysis Date	Time Me	Wethod
Cyanide, Total	mg/L mg/L umho/cm mg/L s.U.	0.09 0.01 590 3.9 7.37	0.01 1.0 1.0 0.10	AAAAA		05/14/98 05/20/98 05/11/98 05/15/98	00000	5.1
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved Vanadium, Dissolved	1/6m 1/6m 1/6m 1/6m 1/6m 1/6m	OND 0.68 35 ND	0.004 0.0051 0.001 0.001 0.01		KHA KHA KHA JYH KHA	50 1 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8	4 233 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	. 00000
						II		

Lab Sample ID: L9805144-02 Client Sample ID: MW-17 Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/07/98 N/A

Analyte	Units	Result Qualifiers	RL Dil	Type	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L mg/L umho/cm mg/L	0.72 0.09 570 3.4	0.02 0.00 0.10 0.10 0.10	AAAAA	JWR SJM MAR MAR	05/14/98 05/20/98 05/11/98 05/15/98	09:00 335.4\9010 14:00 335.1 09:55 120.1 09:30 340.2
Arsenic, DissolvedBeryllium, Dissolved		ON ON		A AA	KHA KHA	/07/ /18/	:35 150 :45 601 :45 601
Sodium, Dissolved	T/Sw mg/r mg/r	1.8 34 ND	0.01 0.50 0.01 1	N'A N'2 A'2	KHA JYH KHA	05/18/98 05/18/98 05/18/98	13:45 6010B 16:09 6010B 13:45 6010B

Matrix: Water Collected: 05/07/98 N/A

COC Info: N/A

Matrix: Water Collected: 05/07/98 N/A

	ЮН
: L9805144-03 : MW-29S	HM003.07/ORMET/HANNIBAL,
## ##	ä
Lab Sample ID: Client Sample ID:	Site/Work

Analyte	Units	Result Qualifiers	RL Dil	Type	Analyst	Analysis Date	Time Method
Cyanide, Total	ł.	0.18 1700 26 8.64	निसम्बद	NNNN	JWR SJW MAR MAR SJW	05/14/98 05/20/98 05/11/98 05/15/98 05/07/98	00000
Beryllium, Dissolved	1/5m 1/5m 1/5m 1/5m 1/5m	OND OND 370 OND	0.004 1 0.005 1 0.01 1 0.50 1	NNNN NAZA AGGZ	KHA KHA JYH KEA	05/18/98 05/18/98 05/18/98 05/18/98 05/18/98	13:50 6010B 13:50 6010B 13:50 6010B 16:42 6010B 13:50 6010B

Lab Sample ID: L9805144-04 Client Sample ID: MW-29D Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/07/98 N/A

Analyte	Unita	Result Qu)ualifiers	RL	Dil	Type	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L	0.17	ļ.	0.01	1	N/A	JWR	/14/9	00:
Specific Conductance		550	ON ON	TO 0.	— 1 (-	Z Z	SUM TAN	720/9	:00 335.1
Fluoride		3.5		0:10	4 1	K/X	MAR	05/11/98	09:55 IZU.1
••••••••••••••••		7.65			_	N/A	SJM	6/10/	:35 150.
Arsenic, Dissolved	mg/L		Q!	0.004	-	N/A	KHA	5/18/9	54
Mandanese, Diesolyted		,	QN		7	N/A	KHA	05/18/98	13:54 6010B
Sodium. Dissolved		æ. ⊣ (0.01		N/A	KHA	5/18/9	: 54
Vanadium. Diagolved		70	į	.50	_	R-2	JYH	5/18/9	:47
······			ON.	.01		N/A	KHA	5/18/9	: 54

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Lab Sample ID: L9805144-05 Client Sample ID: FIELD BLANK Site/Work ID: HM003.07/ORMET/HANNIBAL, OH

Matrix: Water Collected: 05/07/98 N/A

								-		
Analyte	Units	Result	Qualifiers	RL	Dfl	Type	Analyst	Analysis Date	Time	Method
Cyanide, Totalspecific Conductance. Fluoride. pH Arsenic, Dissolved. Beryllium, Dissolved. Manganea, Dissolved. Sodium, Dissolved.	mg/L umho/cm mg/L s.U. mg/L mg/L mg/L mg/L	0.0	18 8	0.01 1.0 0.10 0.004 0.0005 0.01 0.50		NNNN NNNNN Adda dada-n		05/14/98 05/11/98 05/07/98 05/18/98 05/18/98 05/18/98	14.35 14.35 14.35 14.35 16.35	335.4\9010 120.1 340.2 150.1 6010B 6010B 6010B 6010B

Page of

CHAIN - OF - CUSTODY RECORD

Project Number Project Name/Location	Project Name/Loca		/			Container De	Container Description/ Number of Containers	Jore		
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Sample ID	Date/Time	Sample Code	200 <u>5</u> 200 <u>5</u>	ಯ						, ATOT
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mw-34d	5-7-98	٦	_	_						7
MW-17	-		_	_						
MW-295			-		_					C
MW-29D				_						, 0
Field Blank)	→	-	_	-					10
Sample Code: L = L	= Liquid; S = Solid; A	A = Air						Tote	Total Number of Containers:	
Relinquished by:			Organization:		That		Part 12	Timo	1286	0.111100
Received by:	Man II		Organization:	:	1		Date:	Time:		Yes No NA
Relinquished by:	,	6	Organization:]			Date:	Time:	and the second s	I Intaci
Received by:	King H.		Organization:	1	KEMPON	7	Date: 7/11/4/98	Time:	1155	Yes No NA
REMARKS: RULA	后在之人	T DN	detecta	ble	results	۲ کاد کاد	YOU Amendal		747S 0.10	
	NO BOOK	7777	doch	X.	In Hemior			3	315 50	yed watact
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DELIVERY METHOD:	in Person		Comi	Common Carrier	rrier		Lab Courier		Other	

APPENDIX B-3

LABORATORY ANALYTICAL REPORT FOR AUGUST/SEPTEMBER 1998 MONITORING EVENT



Ormet Corporation Hydrosystems Management Inc. 331 S. Main Street, Suite 109 Washington, PA 15301 Attention: Bob Fargo

Login #: L9809021 Report Date: 09/16/98 Work ID: HM003.08/ORMET/HANNIBAL, OH Date Received: 09/01/98

PO Number: Account Number: ORMET-086

SAMPLE IDENTIFICATION

Sample Sample Number Description	L9809021-02 MW-5 L9809021-04 MW-16 L9809021-06 MW-28 L9809021-08 MW-31	
ole Iption		7114 K
Sample Description	1 MW-2 3 MW-12 5 MW-18 7 MW-28D	MW-31D MW-35 MW-37

REVISED REPORT

All results on solids/sludges are reported on a dry weight basis, where applicable, unless otherwise specified. This report shall not be reproduced, except in full, without the written approval of KEMRON.

NYSDOH BYAP ID: 10861

Certiffed By Dennis S. Tepe



Lab Sample ID: L9809021-01 Client Sample ID: MW-2 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 09/01/98 N/A

Analyte	Units	Result Qualifiers	RL Dil	Туре	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L mg/L umho/cm mg/L s.U.	21 0.30 1900 69 9.96	1.0 0.01 1.0 1.0 1.0	ANNN AAAA	SCIM SCIM SLIJ DLN	09/04/98 09/09/98 09/04/98 09/03/98	13:00 335.4\9010 14:00 335.1 14:30 120.1 09:63 340.2
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved	1/5w 1/2/5w 1/5w 1/5w 1/2/6w	0.086 0.00089 0.90 440 0.051	0.004 0.0005 0.01 0.50 1	N/N N/A R/A P-2	ALC ALC SLP SLP	00/ 00/ 00/ 00000	6:44 601 6:44 601 6:44 601 8:09 601 8:09 601
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Sample Weight: N/A Extract Volume: N/A	% Solid: N/A	Method: 8260B Run ID: R52108	flers RL Dilution	5.0 1	118%) 120%) 110%) 115%)
	m	7	Qualifiers	QN QN	86 88 88 88 88 88 88 88 88 88 88 88 88 8
N/A N/A	36/10/60	HPMS2 SLT 20R26117	Result		
Dil. Type: N/A COC Info: N/A	Date Collected: 09/01/98	Instrument: Analyst: Lab File ID:	Units	ng/I	107 102 112
Lab Sample ID: 19809021-01 Client Sample ID: MW-2 Site/Work ID: HM003.08/ORMET/HANNIBAI. OH	Matrix: Water	TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 09/10/98 Time: 20:20	CAS # Compound	127-18-4 Tetrachloroethene	SURROGATES - In Percent Recovery: Dibromofluoromethane

Lab Sample ID: L9809021-02 Client Sample ID: MW-5 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 09/01/98 N/A

COC Info: N/A

Analyte	Units	Result Qualifiers	RL	דום	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total. Cyanide, Amenable to CI. Specific Conductance. Fluoride. Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodium, Dissolved.	mg/r nmg/r nmg/r s.U. mg/r mg/r mg/r mg/r mg/r	2.0 0.02 1200 18 8.92 0.0089 ND 240 ND	0.10 0.01 1.0 0.20 0.004 0.005 0.01	24404 44444	NNNN NNNN AGGGG GGGGG		09/04/98 09/04/98 09/03/98 09/03/98 09/08/98 09/04/98 09/04/98	113 144 16:144 16:144 16:144 16:144 16:144 16:144 16:144 16:144 16:144 16:144	335.4\9010 335.1 120.1 120.1 150.1 150.1 6010B 6010B 6010B

Product: 826-SPE-VO - Special List - 8260

Sample Weight: N/A Extract Volume: N/A	% Solid: N/A	Method: 8260B Run ID: R52227
Dil. Type: N/A COC Info: N/A	Date Collected: 09/01/98	Instrument: HPMS8 Analyst: SLT Lab File ID: 80R03796
Lab Sample ID: L9809021-02 Client Sample ID: MW-5 Site/Work ID: HM003.08/ORMET/HANNIBAL. OH	Matrix: Water	TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 09/11/98 Time: 14:33

CAS #	Compound	Units	Result	Onalifiare	DT.	ָרָ רָּרָ בְּיִרָּ	
7 00 7				100	7	DITTO	
12/-18-4	12/-18-4 Tetrachloroetheneug/L	ng/L		CN	5.0	-	1
SUR	SURROGATES - In Percent Recovery:						
		8 86	,	700			
	1 2-Dichloroethang.dd	2	_	ı			
	HOLD TO THE CONTROL OF THE CONTROL O	101	_	,			
	TOTACTION TO THE PROPERTY OF T	107	_	1			
	P-promoting the properties of	107	~	86 - 115%)			

Lab Sample ID: L9809021-03 Client Sample ID: MW-12 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 09/01/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL Dil	1 Type	Analyst	Analysis Date	Time Method	}
Cyanide, Total	mg/L umho/cm mg/L S.U.	470 0.92 7.57	ND 7	0.01 1 0 10 11 11 11 11 11 11 11 11 11 11	NNN AAAA	SJM SLJ DLN SLJ	09/04/98 09/04/98 09/03/98	335.4 120.1 340.2	\9010
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved Vanadium, Dissolved	I/Sw I/Sw I/Sw I/Sw	1.6	ON ON	0.0041 0.00051 0.01 0.50 1	N//A N//A R-/2	ALC SLP SLP ALC	9 / 90 / 90 / 90 / 90 / 90 / 90 / 90 /	.44 601 :26 601 :26 601 :44 601	
	!								

Lab Sample ID: L9809021-04 Client Sample ID: MW-16 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 09/01/98 N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Туре	Analyst	Analysis Date	Time Method
Cyanide, Total	mg/L mg/L umho/cm mg/L s.U.	1.4 1.4 860 9.5 7.70	0	0.10 0.01 1.0 0.10	0	NNNN AAAAA	SCIN SCIN SCIN SCIN	09/04/98 09/09/98 09/04/98 09/03/98	13:00 335.4\9010 14:00 335.1 14:30 120.1 09:05 340.2
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved Vanadium, Dissolved	1/5w 1/5w 1/5w 1/5w 1/5w	1.3		0.004 0.0005 0.01 0.50	ਜਜਜਜਜ	NNNN AAAA-	ALC SLP SLP ALC	0000	31 601 31 601 119 601

Lab Sample ID: L9809021-05 Client Sample ID: MW-18 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 09/01/98 N/A

Analyte	Units	Result Qualifiers	RL D11	1 Type	Analyst	Analysis Date	Time Wethod
Cyanide, Total	mg/L umbo/cm umbo/cm mg/L mg/L mg/L mg/L mg/L	5.9 ND 3600 210 9.70 0.00084 0.29 800 0.022	0.25 25 0.01 1 1.0 1 2.5 25 0.004 1 0.005 1 0.01 1	NNNN NNNN AGAGG AGGGC-	SUM SLU SLU DLIN SLU ALC ALC SLP SLP SLP	1	

8260
82
1
List
Special
ſ
826-SPE-VO
Product:

Sample Weight: N/A Extract Volume: N/A	% Solid: N/A	Method: 8260B Run ID: R52227	s RL Dilution	5.0 1	i
EX			Qualifiers		86 - 118%) 80 - 120%) 88 - 110%) 86 - 115%)
N/A N/A	86/10/60 :	HPMS8 SLT 80R03797	Result	14	
Dil. Type: N/A COC Info: N/A	Date Collected: 09/01/98	Instrument: Analyst: Lab File ID:	Units	ng/L	98.2 102 107 108
Lab Sample ID: L9809021-05 Client Sample ID: MW-18 Site/Work ID: HM003.08/ORMET/HANNIBAL. OH	Matrix: Water	TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 09/11/98 Time: 15:07	CAS # Compound	127-18-4 Tetrachloroethene	SURROGATES- In Percent Recovery: Dibromofluoromethane

Login #L980,021 September 16, 1998 09:25 am

KEMRON ENVIRONMENTAL SERVICES

Lab Sample ID: L9809021-06 Client Sample ID: MW-28 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 09/01/98 N/A

COC Info: N/A

Analyte	Units	Result Qualifiers	RL Dil	Туре	Analyst	Analysis Date	Time Method
Cyanide, Total. Cyanide, Amenable to Cl. Specific Conductance. Fluoride.	mg/L mg/L umbo/cm mg/L s.U.	0.11 0.11 540 0.27 5.81	0.01 1.0 1.0 1.0 1.0	A/NNN A/NN A/N		09/04/98 09/09/98 09/04/98 09/03/98	
Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	7/5w 1/5/27 1/5w 1/5/27 1/5/27	ND ND 64 ND	0.004 1 0.0005 1 0.01 1 0.50 1	RNNNN 7-2AAA 7-2AAAA 7-2AAAAA	ALC ALC SLP SLP	0 0000 0 0000 0 00040 0 00000	4:5/ 150. 9:31 6010 9:31 6010 8:28 6010 8:28 6010
Lab Sample ID: L9809021-07 Client Sample ID: MW-28D			Matrix: Water	*/ ht			

Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Collected: 09/01/98 N/A

Analyte	Unita	Result Qualifiers	RL Dil	Type	Analyst	Analysis Date	Time Method	ļ Pg
Cyanide, TotalCyanide, Amenable to Cl. Specific Conductance. Fluoride.	mg/L mg/L umho/cm mg/L s.U.	0.11 0.11 540 0.24 5.83	0.01 1.0 1.0 1.0 1.0	A/NNN/A/NA/A/NA/A/NA/A/N/A/A/A/A/A/A/A/	i	09/04/98 09/09/98 09/04/98 09/03/98	00000	1 \ 9010
Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodium, Dissolved Vanadium, Dissolved	1/5m 2/17 2/5m 1/5m 1/5m	O.01 ND 65 ND	0.004 1 0.0005 1 0.01 1 0.50 1	NN/A R/APA 2APA	ALC ALC SIP SIP ALC	00000 00440 00000	6010 6010 6010 6010	4

Lab Sample ID: L9809021-08 Client Sample ID: MW-31 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 09/01/98 N/A

COC Info: N/A

								!
Analyte	Units	Result Qual	Qualifiers	RL	Dil Ty	Type Ana]	Analyst Date	Time Method
Cyanide, Total	mg/L mg/L umho/cm mg/L S.U.	9.8 2600 120 9.67	MD	0.50 50 0.01 1 1.0 1 2.5 25		N/A SUM N/A SUJ N/A SLJ N/A DLN N/A SLJ		00000
Arsenic, Dissolved Beryllium, Dissolved Manganese, Dissolved Sodium, Dissolved Vanadium, Dissolved	7/5m 2/7 2/5m 2/7 2/6m 2/6m	0.0044 0.0014 1.1 620 0.045	5	0.004 1 0.0005 1 0.01 1 0.50 1	ZZZZK	N/A KHA N/A KHA N/A SLP N/A SLP R-2 KHA	09/11/98 09/11/98 09/04/98 09/04/98	.45 6010 .38 6010 .38 6010 .45 6010
Product: 826-SPR-WO -		0960						
	, 0		Dil. Type: COC Info: Date Collected:	a: N/A b: N/A 1: 09/01/98	86/	Sample Extract	Weight: Volume:	N/A A/N A/A
TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 09/11/98 Tin	Time: 15:40				867		Method: Run ID:	8260B R52227
CAS # Compound			Units	Result		Qualifiers	RL	Dilution
127-18-4 Tetrachloroethene			ug/L		17		5.0	1

RL = Reporting Limit

118%) 120%) 110%) 115%)

88 88 88 88

SURROGATES - In Percent Recovery:

Dibromofluoromethane.

1, 2-Dichloroethane-d4.

Toluene-d8.

p-Bromofluorobenzene.

Page 8 of 12

Login #L980, 21 September 16, 1998 09:25 am

Lab Sample ID: L9809021-09 Client Sample ID: MW-31D Site/Work ID: HW003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 09/01/98 N/A

Analyte	Units	Result Qua	Qualifiers	RL I	Dil Type	Analyst	Analysis Date	Time N	Method
Cyanide, Total	mg/L mg/L umho/cm mg/L S.U.	9.5 2700 130 9.67	QN	0.50 0.01 1.0 2.5 1.5 1.5	NNNN	SS SS SS SS SS SS SS SS SS SS SS SS SS	09/04/98 09/09/98 09/04/98 09/03/98	13:00 14:00 14:30 09:05	335.4\9010 335.1 120.1 340.2 150.1
Arsenic, Dissolved	1/5 1/5 1/5 1/5 1/5 1/5	0.045 0.0013 1.1 600 0.043	·	0.004 1 0.0005 1 0.01 1 0.50 1	N/AP N/AP R-2	KHA KHA SLP SLP KHA	09/11/98 09/11/98 09/04/98 09/04/98	09:40 09:40 118:43 09:43 09:43 69:43	6010B 6010B 6010B 6010B 6010B
Product: 826-SPE-VO - Sp	Special List -	8260							
Lab Sample ID: L9809021-09 Client Sample ID: MW-31D Site/Work ID: HM003.08/ORMET/HANNIBAL, Matrix: Water	HANNIBAL, OH		Dil. Type: COC Info: Date Collected:	e: N/A o: N/A d: 09/01/98	80	Sample Extract %	Weight: N/A Volume: N/A Solid: N/A	<i></i>	
TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 09/11/98 Time:	Time: 16:14		Instrument: Analyst: Lab File ID:		6			8260B R52227	
CAS # Compound			Units	Result	: Qualifiers	iers	RL	Dilution	ŭ
127-18-4 Tetrachloroethene			п/bn		20		5.0	ы	
Dibromofluoromethane 1, 2-Dichloroethane-d4 Toluene-d8 p-Bromofluorobenzene	SOVEEY:		100 103 107		86 - 11 80 - 12 88 - 11 86 - 11	88) 08) 58)			

Login #L980>,21 September 16, 1998 09:25 am

Lab Sample ID: L9809021-10 Client Sample ID: MW-32 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 09/01/98 N/A

COC Info: N/A

Analyte	Units	Result	Qualifiers	RL	Di1	Type	Analyst	Analysis Date	Time	Mathod
Cyanide, Total. Cyanide, Amenable to Cl Specific Conductance. Fluoride.	mg/L mg/L umho/cm mg/L s.U.	4.5 1.0 760 13 8.30		0.25 0.01 1.0 0.20	121125	AAAAAA	i	09/04/98 09/09/98 09/04/98 09/03/98	000100	335.4\9010 335.1 120.1 340.2
Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/L mg/L mg/L mg/L	1.8	en en	0.004 0.0005 0.01 0.50	ਜ਼ਿਜ਼ਜ਼ਜ਼	RNNN-	KHA KHA SLP SLP KHA	9	0.01440 44774) dddd

Lab Sample ID: L9809021-11 Client Sample ID: MW-35 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 08/31/98 N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time	Method
Cyanide, Total	mg/L mg/L umho/cm mg/L S.U.	16 0.99 550 26 8.97	9	1.0 0.01 1.0 0.50	100	AAAAA	SULU SULU SULU SULU SULU SULU SULU SULU	09/04/98 09/09/98 09/04/98 09/03/98	11 41 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1	335.4\9010 335.1 120.1 340.2
Arsenic, Dissolved. Beryllium, Dissolved. Manganese, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	I/Sw I/Sw I/Sw I/Sw	0.01 130.88	1 ND ND	0.004 0.0005 0.01 0.50		NN/N R/\AA 2	KHA KHA SLP SLP KHA	10001	000000	. 00000

KEMRON ENVIRONMENTAL SERVICES

Login #L980>v21 September 16, 1998 09:25 am

Lab Sample ID: L9809021-12 Client Sample ID: MW-36 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 09/01/98 N/A

COC Info: N/A

Analyte	Units	Result Qualifiers	ers RL	D11	Type	Analyst	Analysis Date	Time Method	
Cyanide, Total	mg/L mg/L umho/cm mg/L s.U. mg/L mg/L mg/L	6.5 4500 230 9.90 0.11 0.0036 1.4 990	0.25 0.01 1.0 5.0 0.004 0.005 0.50	12 25 25 25 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NNNN NNNR A4444 A4442		09/04/98 09/04/98 09/03/98 09/02/98 09/11/98 09/11/98 09/04/98	3335.4 1200.1 1200.1 1500.2 1500.2 60100 60100 60100 60100	/9010

Lab Sample ID: L9809021-13 Client Sample ID: MW-37 Site/Work ID: HM003.08/ORMET/HANNIBAL, OH

Matrix: Water Collected: 08/31/98 N/A

Analyte	Units	Result	Qualifiers	RL	Dil	Type	Analyst	Analysis Date	Time M	Method
Cyanide, Total. Cyanide, Amenable to Cl Specific Conductance. Fluoride. Arsenic, Dissolved. Beryllium, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/L mg/L umho/cm mg/L s.U. mg/L mg/L mg/L mg/L	15 670 52 8.90 0.02 140 0.53	0 2 ND 3 ND	1.0 1.0 1.0 1.0 0.004 0.0005 0.0005 0.50	0 0 1 1 1 1 1 1 1	NNNN NNNN 44444 44442	SUM SUN DIN DIN SLJ KHA KHA SLP SLP KHA	09/04/98 09/04/98 09/03/98 09/03/98 09/11/98 09/11/98 09/04/98	1144 1144 1144 1144 1144 1144 1144 114	335.4\9010 335.1 120.1 150.1 150.1 6010B 6010B 6010B 6010B
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am	
09:25	
1998	
16,	
September 16, 19	

Matrix: Water Collected: 09/01/98 N/A	
Lab Sample ID: L9809021-14 Client Sample ID: FIELD BLANK Site/Work ID: HM003.08/ORMET/HANNIBAL, OH	

Analyte	Units	Result	Qualifiers	RĽ	D11	Type	Analyst	Analysis Date	Time Method
Cyanide, Total. Specific Conductance Fluoride. pH Arsenic, Dissolved. Beryllium, Dissolved. Sodium, Dissolved. Vanadium, Dissolved.	mg/L umho/cm mg/L s.U. mg/L mg/L mg/L	5.55	2999 9999 99999	0.00 0.00 0.00 0.00 0.00 0.00 0.00 11 12 10 10 10 10 10 10 10 10 10 10 10 10 10		AAAA AAAA-2-	SUM SLJ DLN SLJ KHA KHA SLP SLP KHA	09/04/98 09/04/98 09/03/98 09/02/98 09/11/98 09/04/98 09/04/98	13:00 335.4\9010 14:30 120.1 09:05 340.2 14:57 150.1 10:12 6010B 19:32 6010B 19:32 6010B 10:12 6010B

8260
1
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pecial
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ı
826-SPE-VO
Product:

Sample Weight: N/A Extract Volume: N/A	% Solid: N/A	Method: 8260B Run ID: R52227	Qualifiers RL Dilution	ND 5.0 1	- 118%) - 120%) - 110%)
N/A N/A	09/01/98	HPMS8 SLT 80R03800	Result C		98888
Dil. Type: N/A COC Info: N/A	Date Collected: 09/01/98	Instrument: Analyst: Lab File ID:	Units	ng/L	99.5 104 107
Lab Sample ID: L9809021-14 Client Sample ID: FIELD BLANK Site/Work ID: HM003 08/ORMET/HANNIPAI		TCLP Extract Date: N/A Extract Date: N/A Analysis Date: 09/11/98 Time: 16:47	CAS # Compound	127-18-4 Tetrachloroethene	SURROGATES- In Percent Recovery: Dibromofluoromethane 1,2-Dichloroethane-d4 Toluene-d8 p-Bromofluorobenzene

Dilution

Qualifiers

Result

Units ng/Γ

5.0 R

118%) 120%) 110%)

880 880 888

101 105 107 108

SURROGATES - In Percent Recovery:

Dibromofluoromethane...

1,2-Dichloroethane-d4...

Toluene-d8...

p-Bromofluorobenzene...

Method: 8260B Run ID: R52227

HPMS8 SLT 80R03801

Instrument: H Analyst: S Lab File ID: 8

Date Collected: 09/01/98

Dil. Type: N/A COC Info: N/A

Product: 826-SPE-VO - Special List - 8260

Login #L980>v21 September 16, 1998 09:25 am

Lab Sample ID: L9809021-15 Client Sample ID: TRIP BLANK Site/Work ID: HM003.08/ORMET/HANNIBAL, OH Matrix: Water

TCLP Extract Date: N/A
Extract Date: N/A
Analysis Date: 09/11/98 Time: 17:21

Compound

127-18-4 CAS #

% Solid: N/A

Sample Weight: N/A Extract Volume: N/A

Environmental Consulting Services

CHAIN - OF - CUSTODY RECORD

56 N M W W M W W W M 5 30 3 Total Number of Containers: Container Description/ Number of Containers HOAN Total + Amenable CM SSO ML Plastic Phispland, Fluoride aso me pleatic Diss As, Be, Ma, We, V SSOML PIROTS 55719 7W OH N NU N Tetrachlowethane (1 2 2 557197WOH Sample Code Ormet / Hannikel Oni Sample Code: L = Liquid; S = Solid; A = Air Project Name/Location 5 Menosky 8/31/98 9/1/98 8/91/98 98 Kempon Date/Time Sampling Personnel FIELD BLANK J Campbell Project Number Sample ID HM003.08 MW-28D MW-317 MW-28 MW-36 Trip Blank MW-32 MW-35 NW-37 MM-31 MW-12 81-MM MW-2 3- MW MM - 16

Ϋ́ (Yes) No NA Seal Intact? Seal Intact? (Ces) No 100,001 16.75 130 presentin each sample. Time: Time: Time: Time: 11/98 Date: Date: Date: Date: 2 total Cyanide KANNON Kranco ton RON run amenable Cyanide Organization: Organization: 1000 1 MCO Organization: Organization: Relinquished by: Received by: Received by: Relinquished by; REMARKS:

Common Carrier in Person

Lab Courier Kemron

DELIVERY METHOD:

APPENDIX C

DATA VALIDATION SUMMARY REPORT FOR 1998 MONITORING EVENTS

Data Validation Summary Report 1998 Remedial Action Ground-Water Monitoring

Ormet Corporation Hannibal, Ohio

Under the Remedial Action Ground-Water Monitoring Plan (Revision 1 - April 28, 1997), ground-water samples were collected in May and September at the Ormet Corporation site near Hannibal, Ohio. The samples were analyzed by Kemron Environmental Services of Marietta, Ohio using SW-846 and EPA protocols. Validation of the analytical results was performed by applying principles and concepts of the USEPA National Functional Guidelines. The validation process included a review of sample holding times, blank results, initial and continuing calibrations, surrogate and matrix spike recoveries, and laboratory control sample results. Based on the validation review, no data qualifiers were determined to be warranted for the results from the May and September ground-water monitoring events.

98-SAMP.DV

APPENDIX D

CONCENTRATION VS. TIME GRAPHS FOR REMEDIAL ACTION MONITORING PARAMETERS

Appendix D-1 Cyanide Amenable to Chlorination

Appendix D-2 Fluoride

Appendix D-3 Arsenic

Appendix D-4 Beryllium

Appendix D-5 Manganese

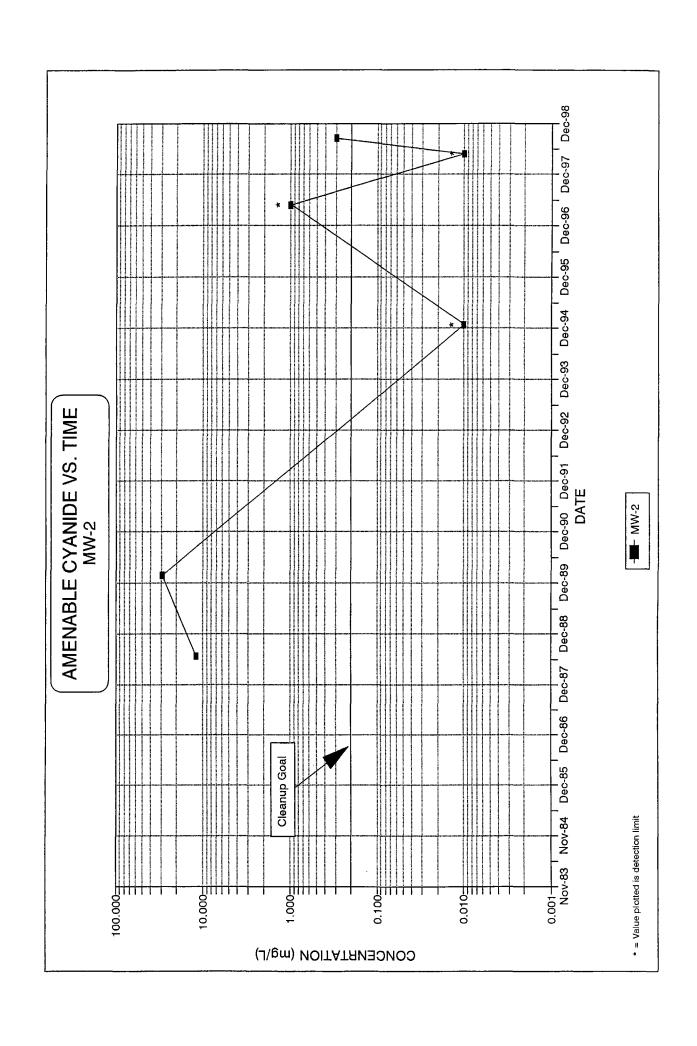
Appendix D-6 Vanadium

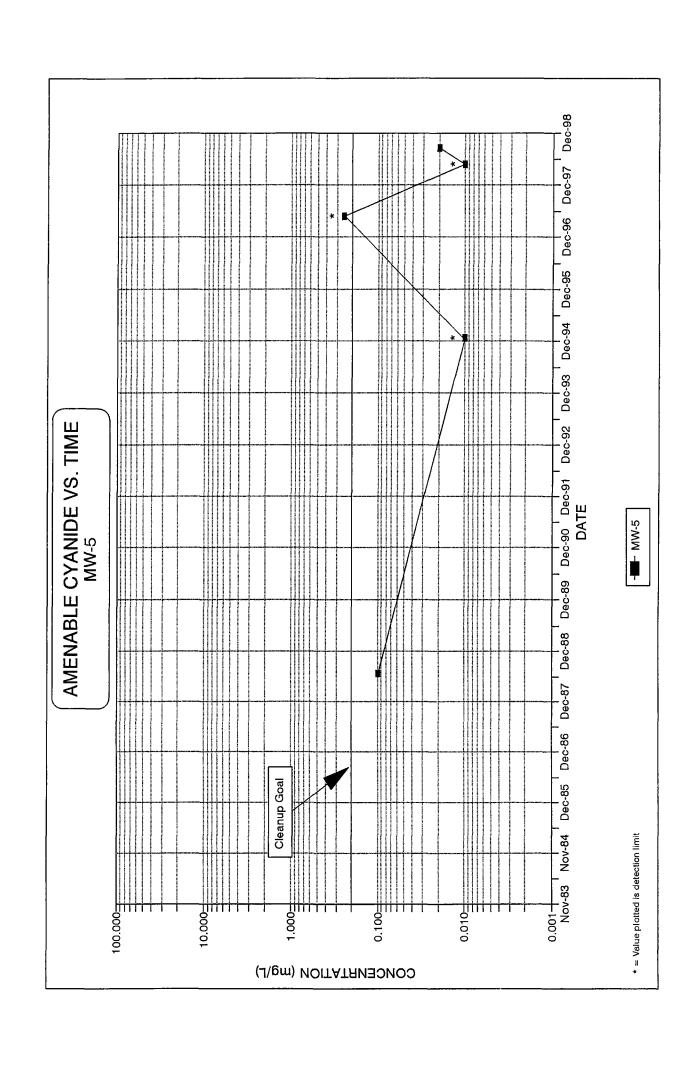
Appendix D-7 Tetrachloroethene

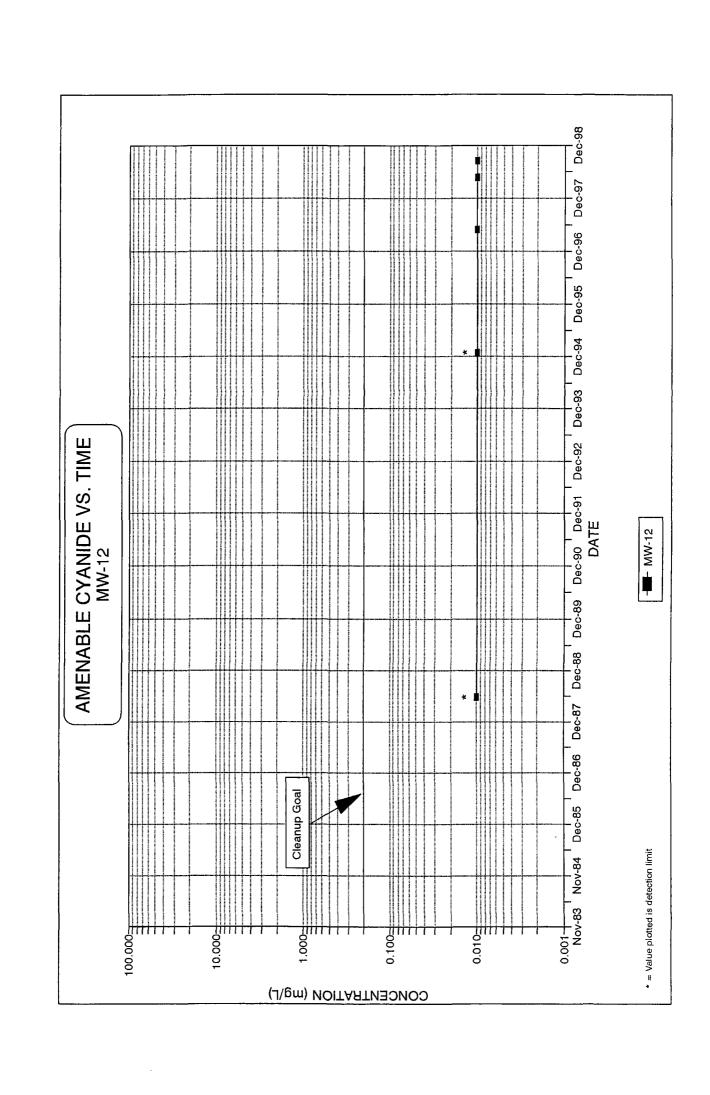
Appendix D-8 Sodium

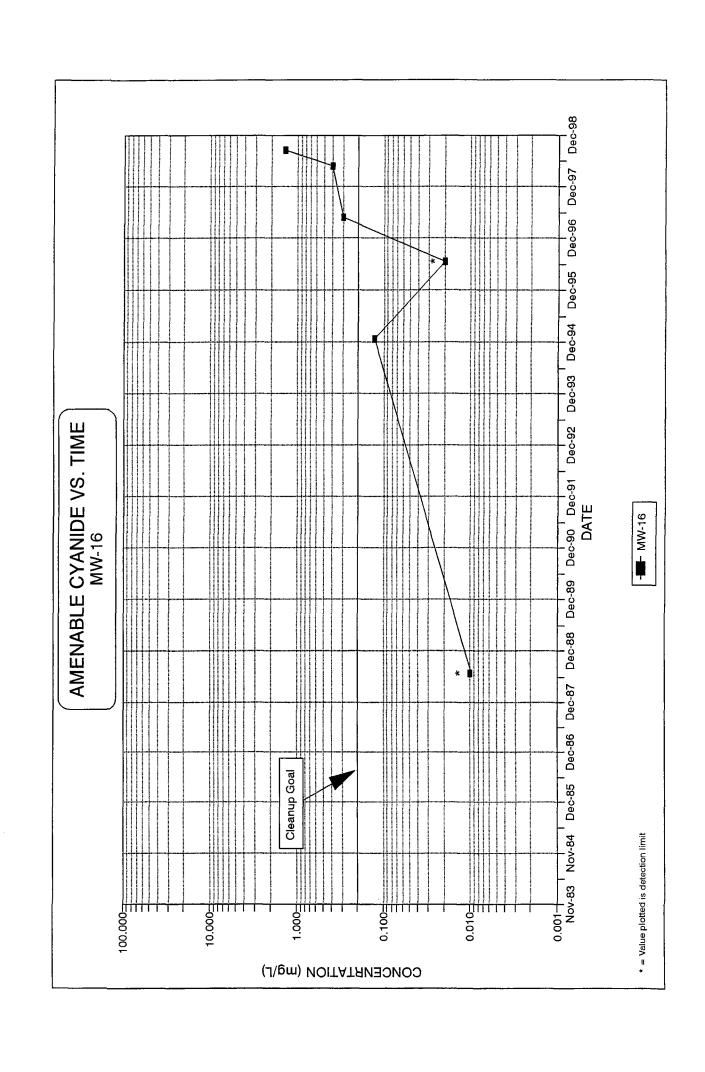
APPENDIX D-1

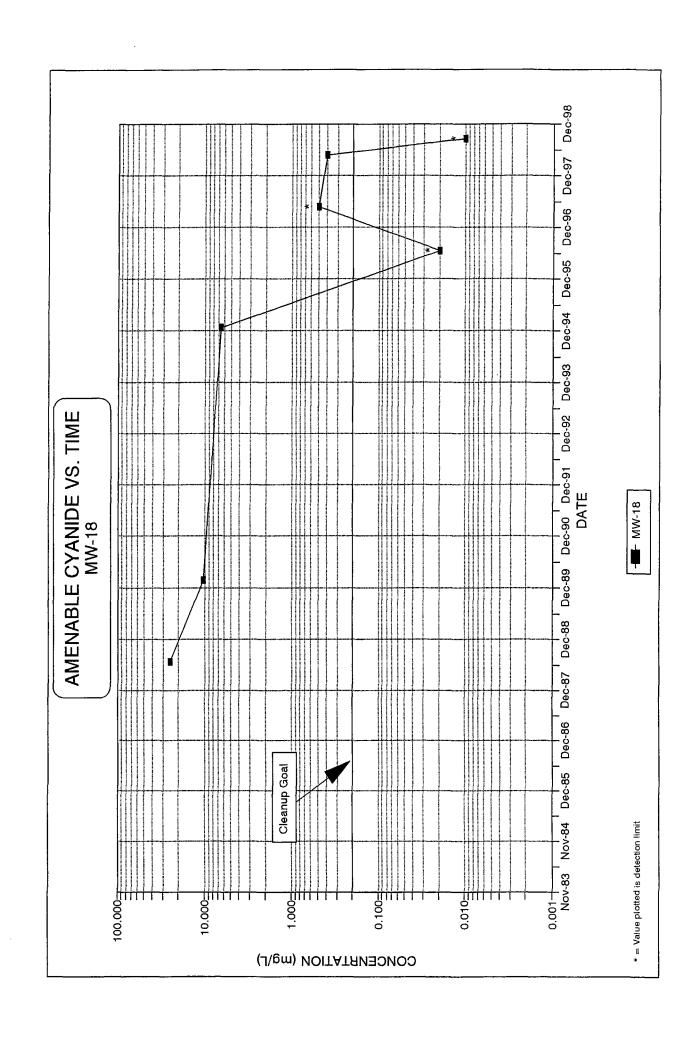
CYANIDE AMENABLE TO CHLORINATION

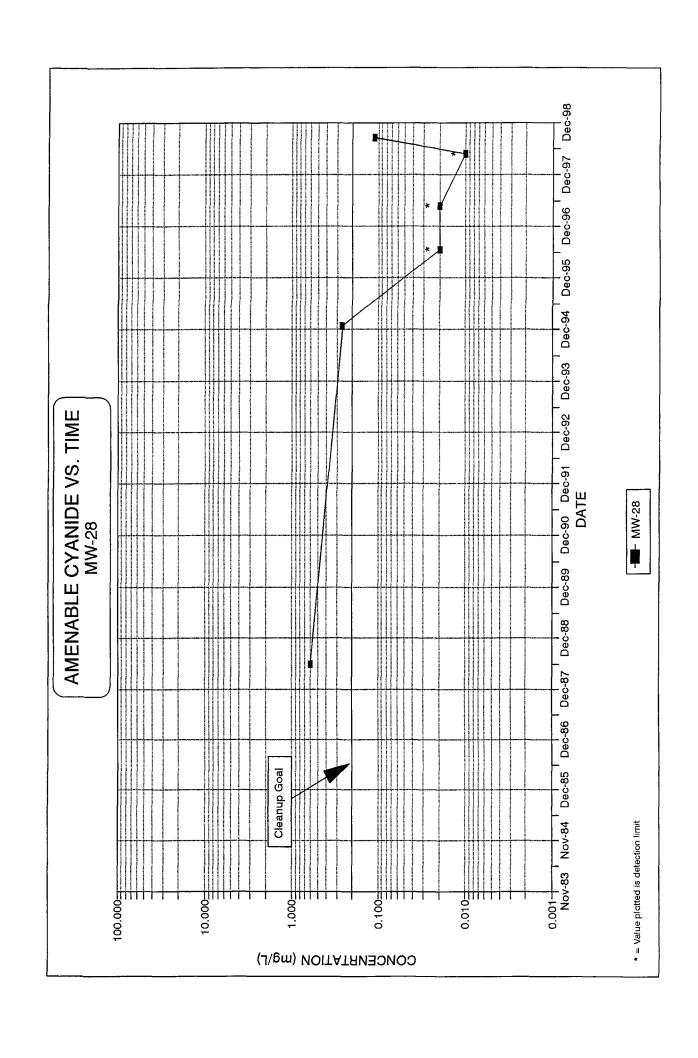


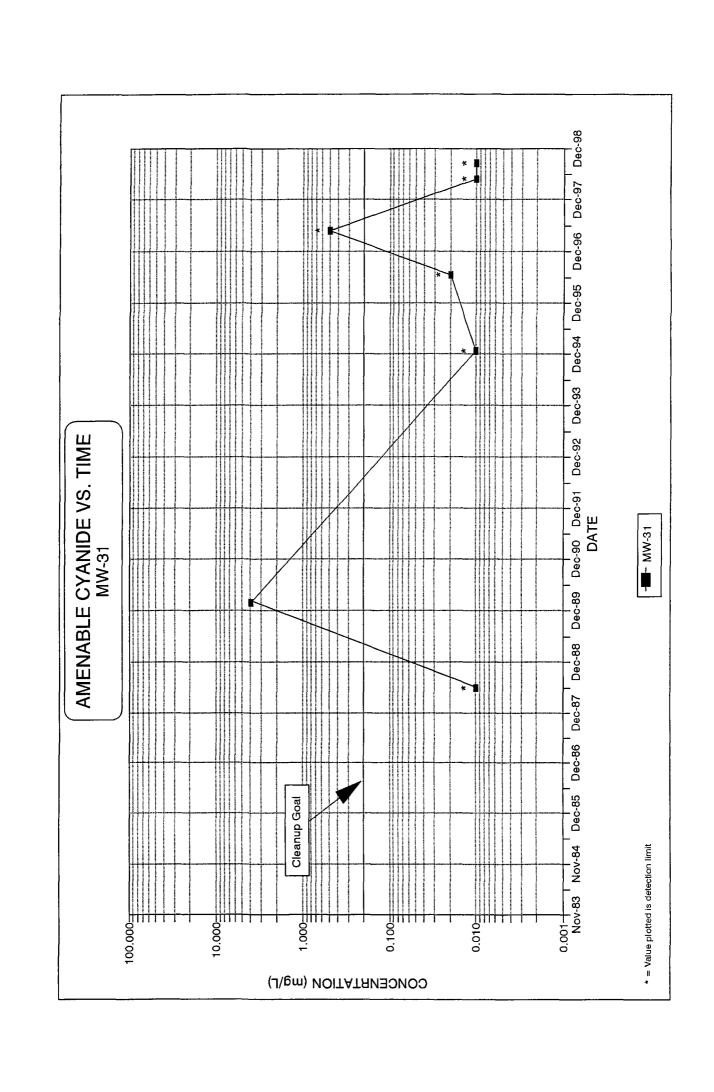


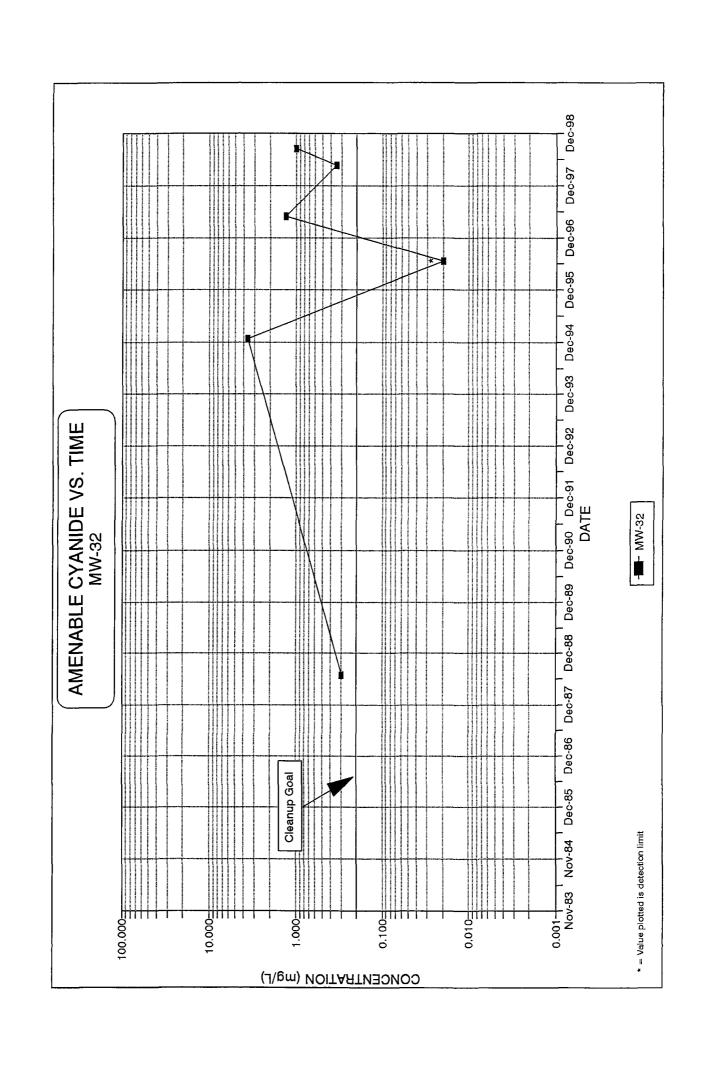


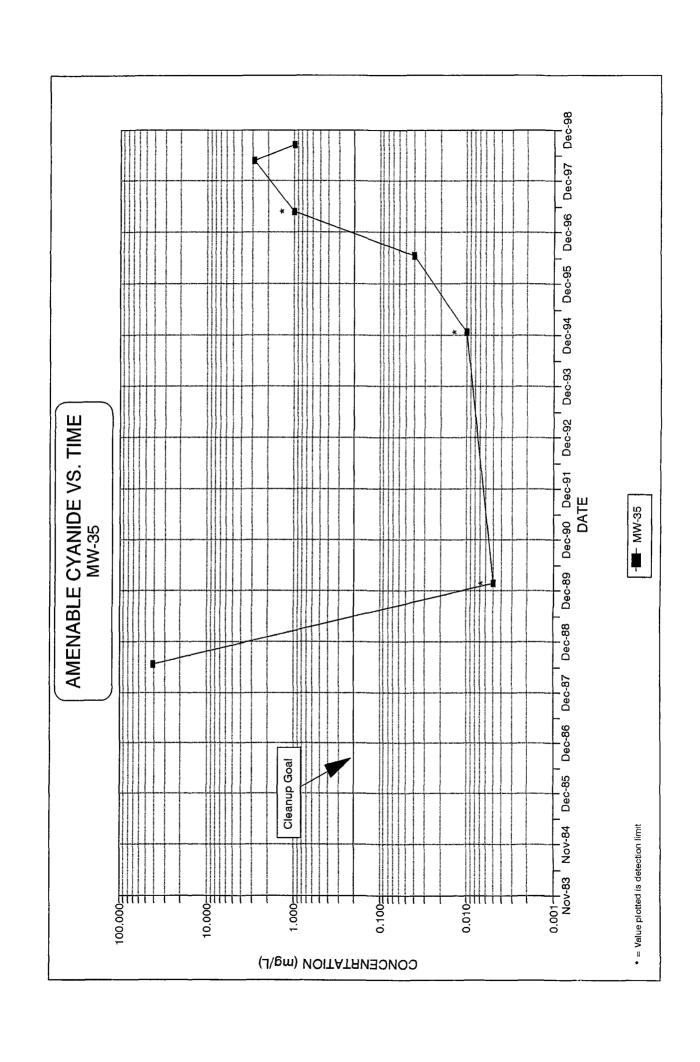


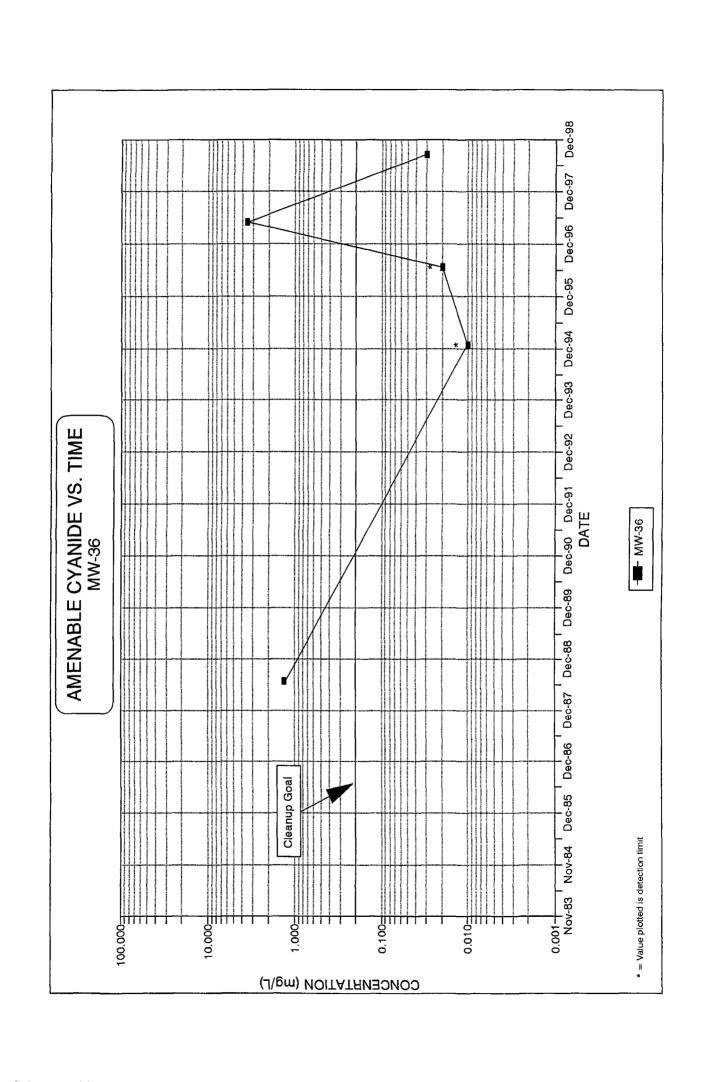


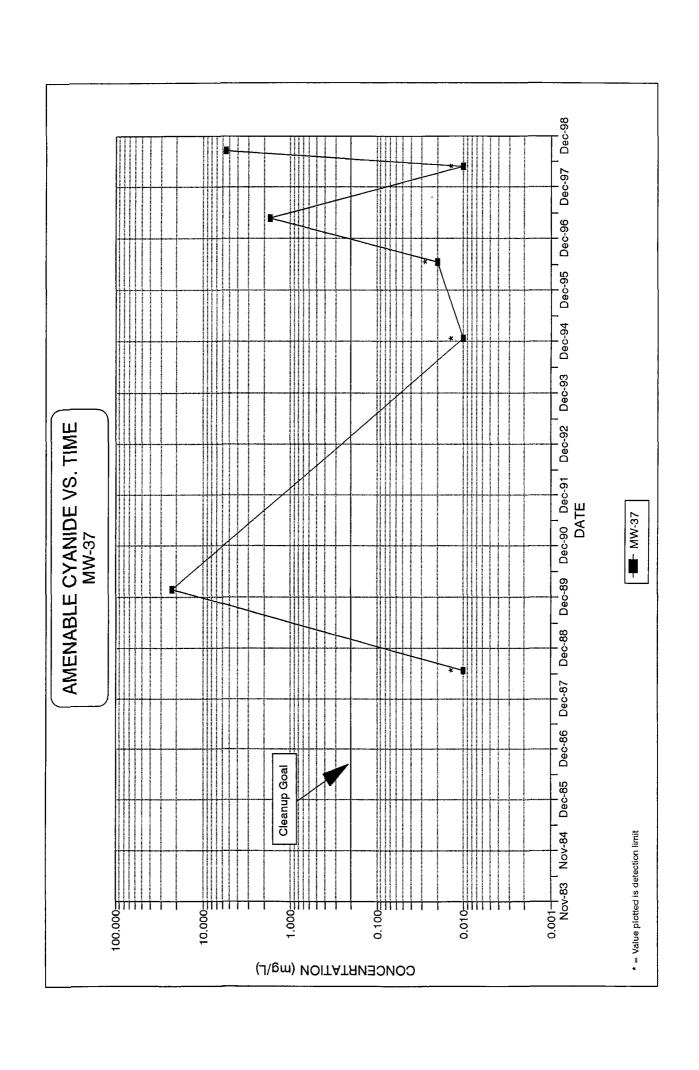






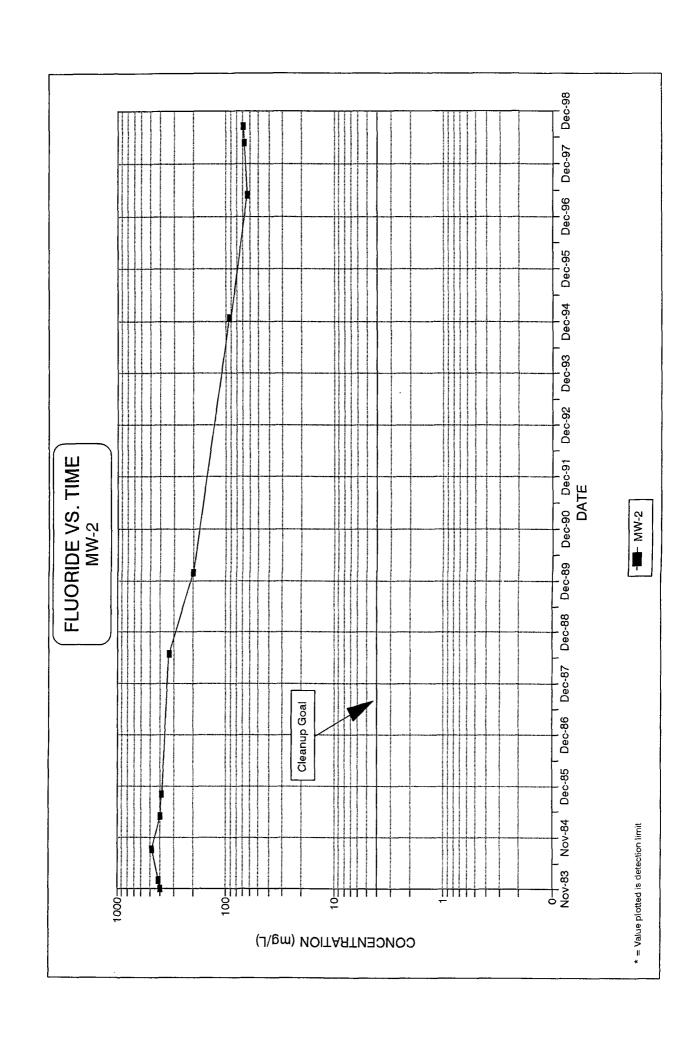


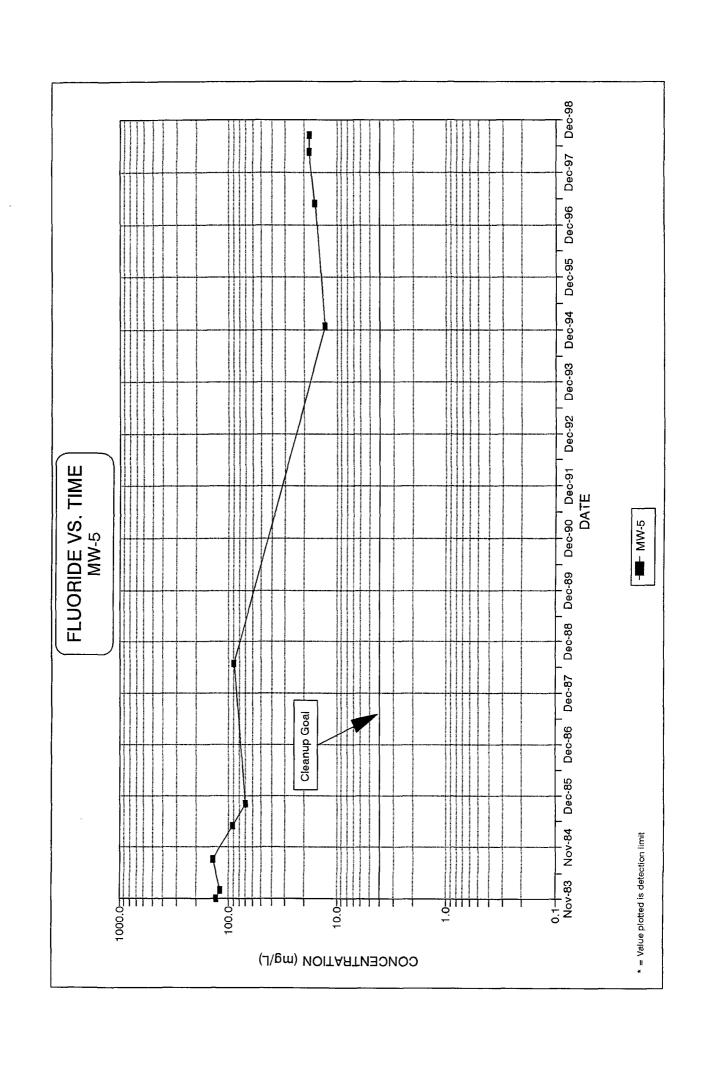


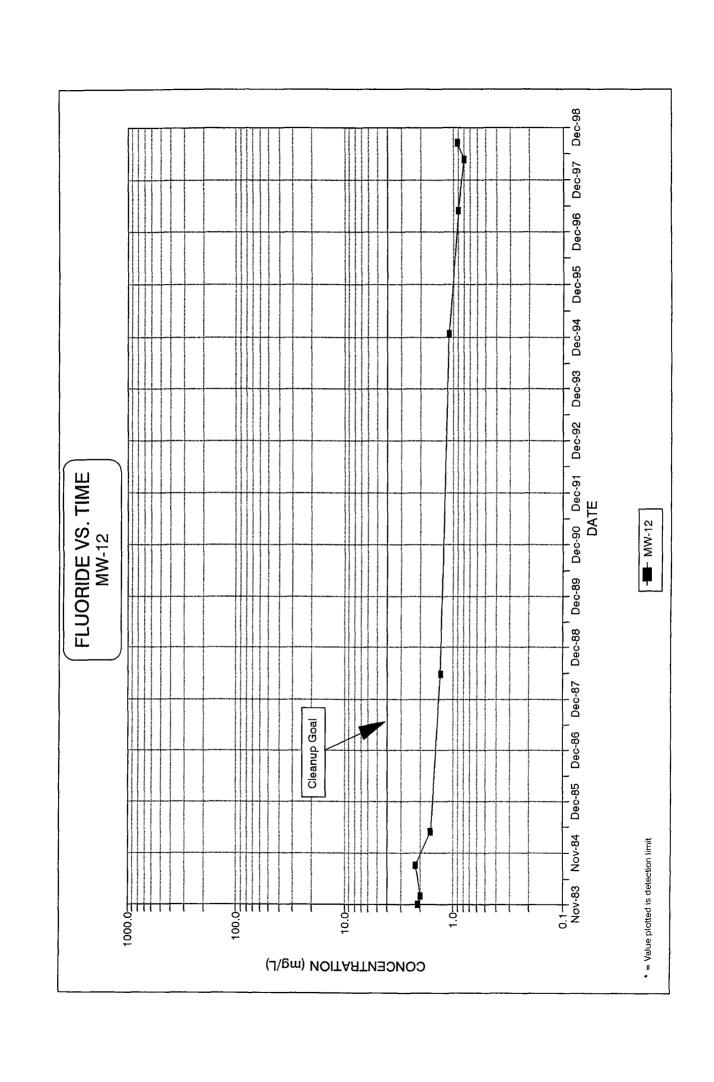


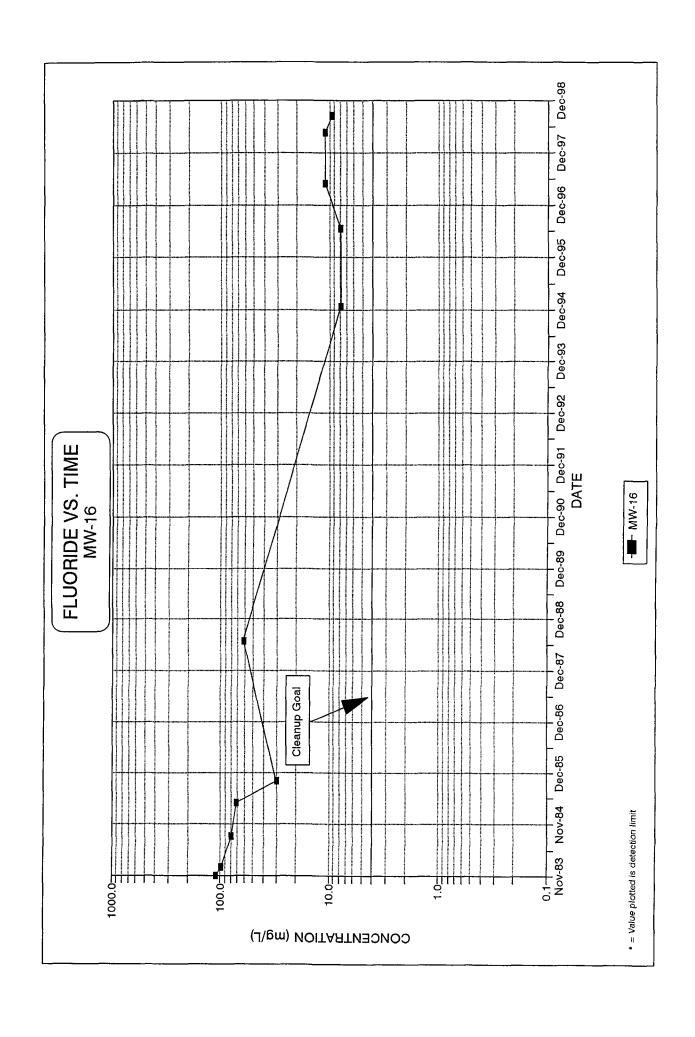
APPENDIX D-2

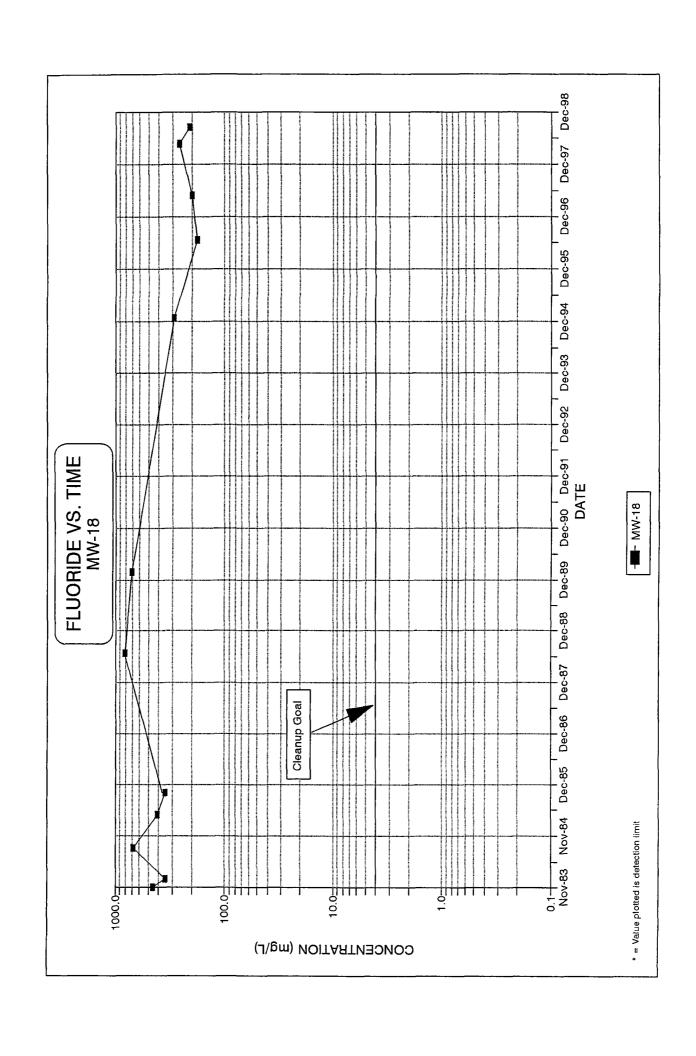
FLUORIDE

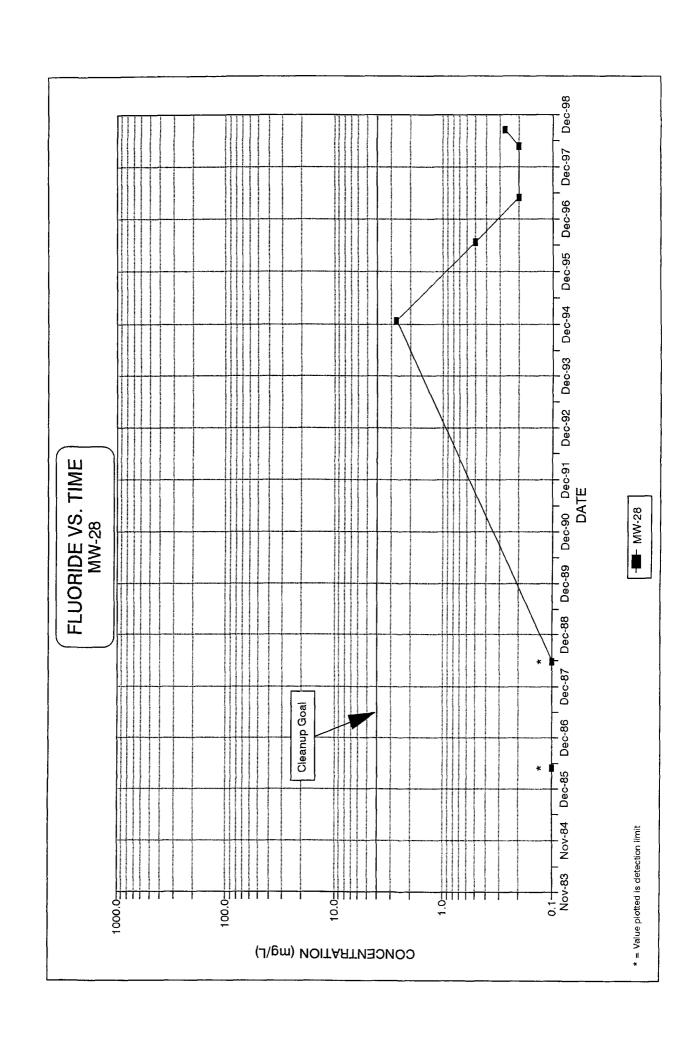


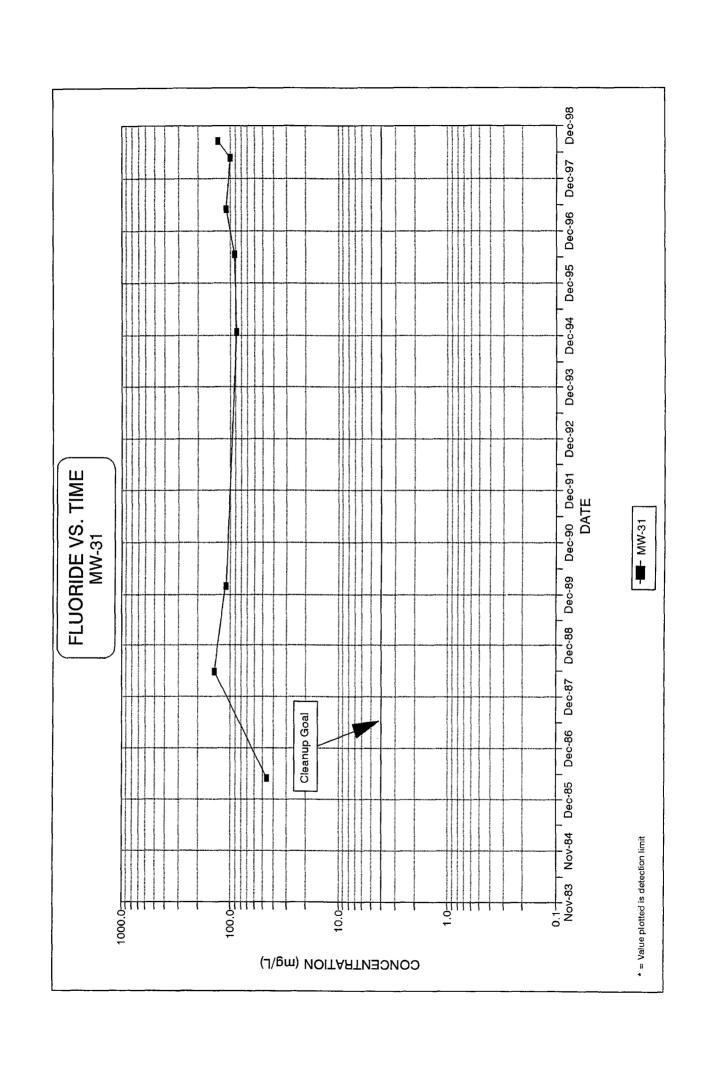


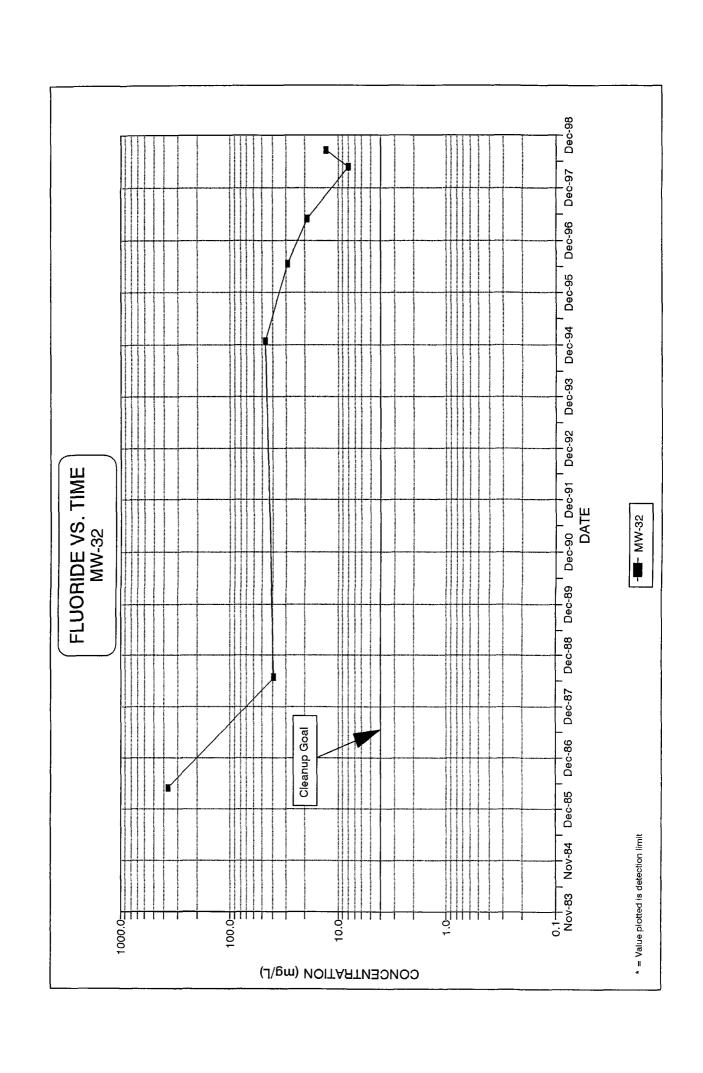


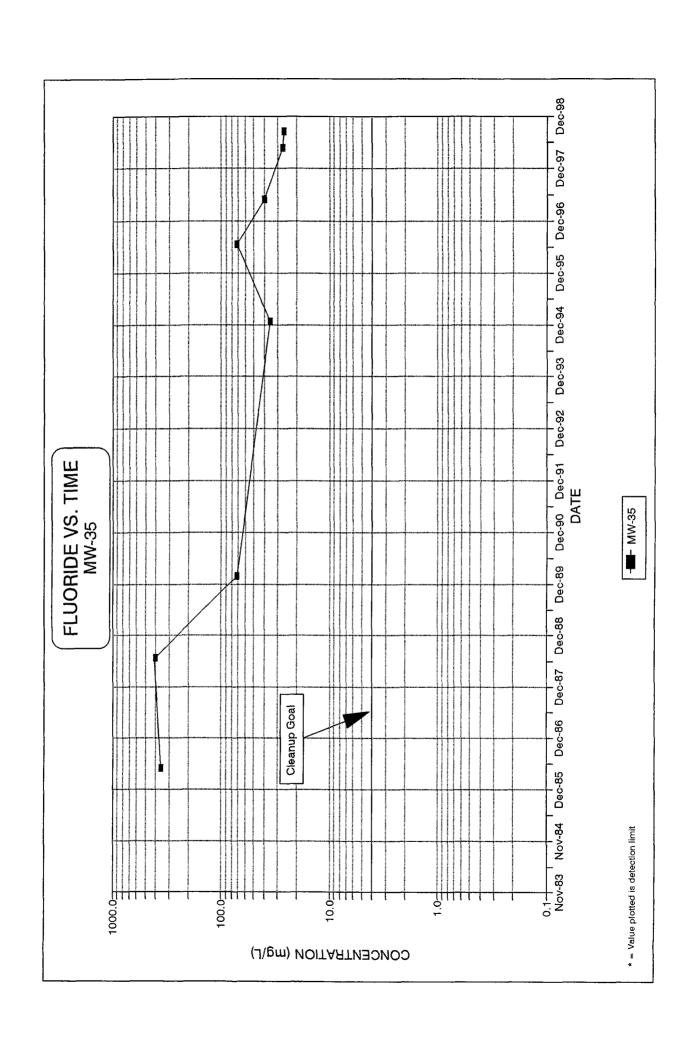


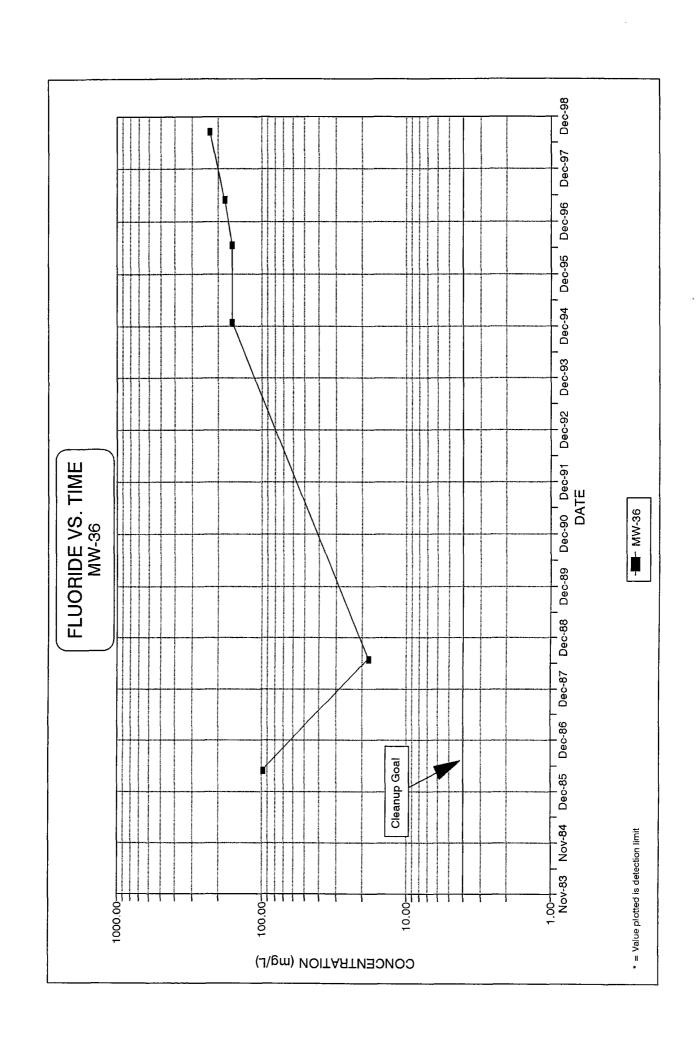


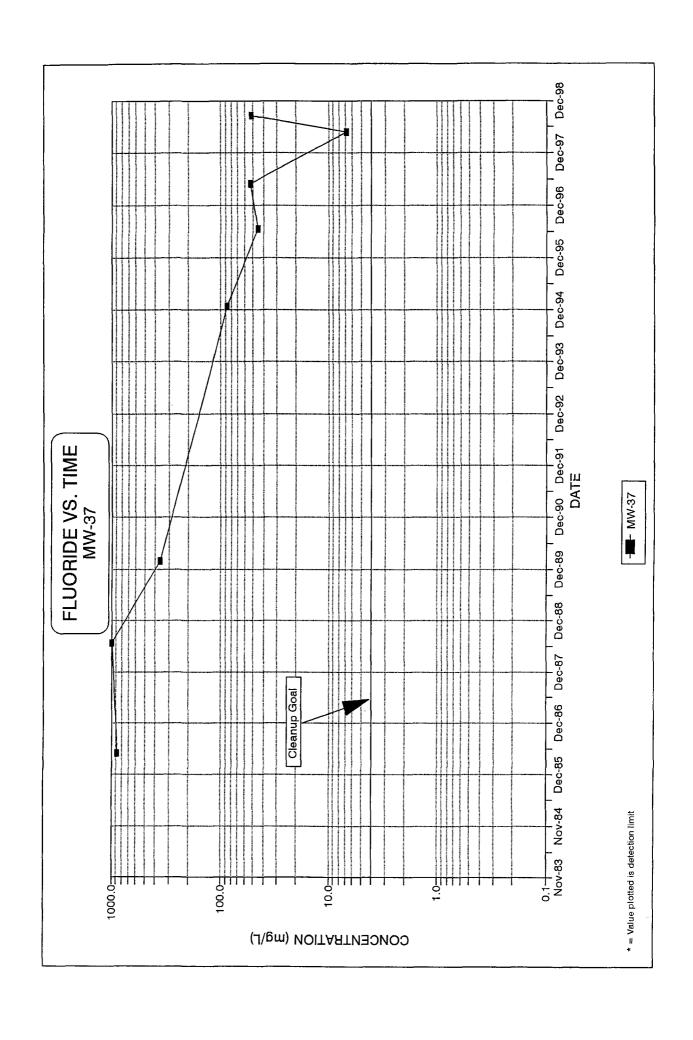






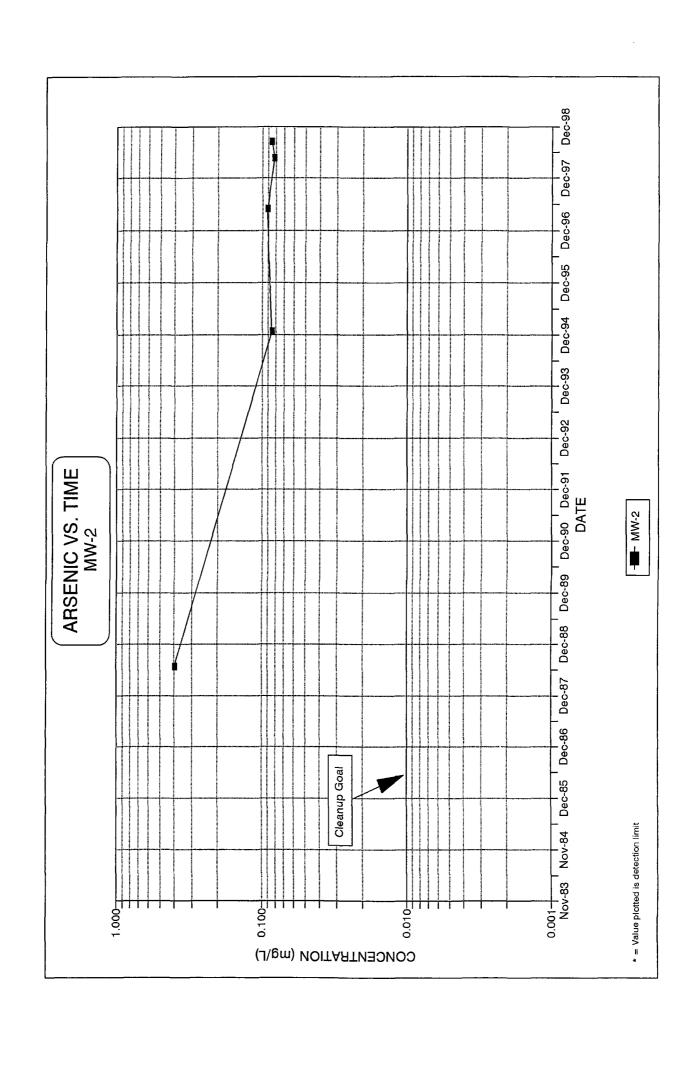


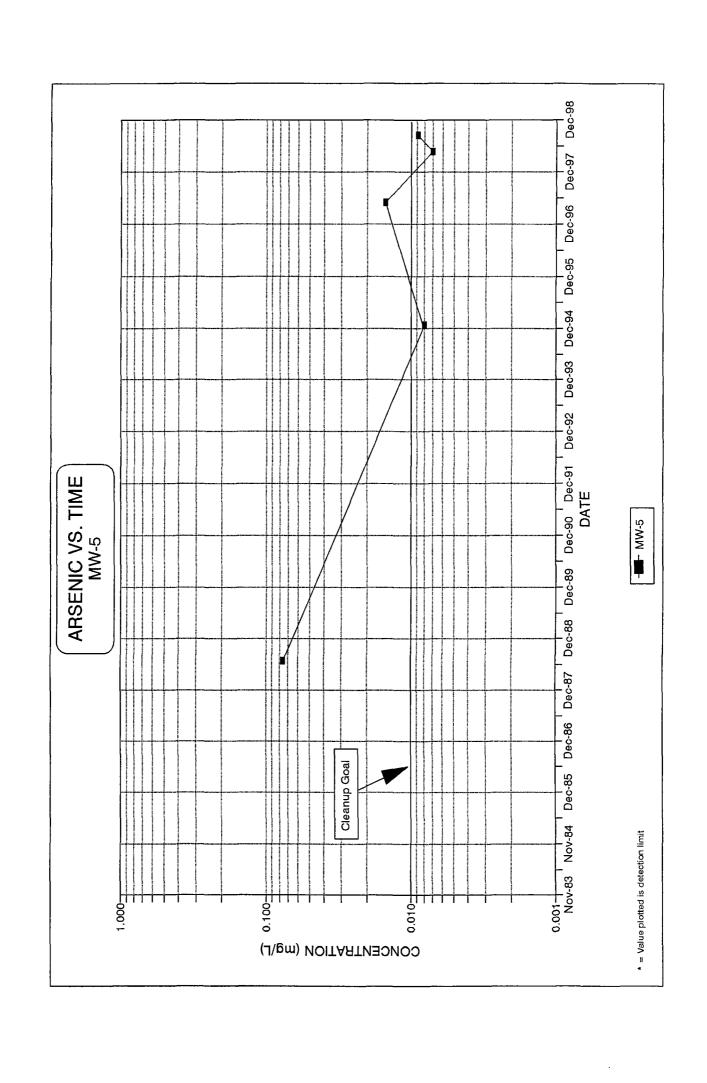


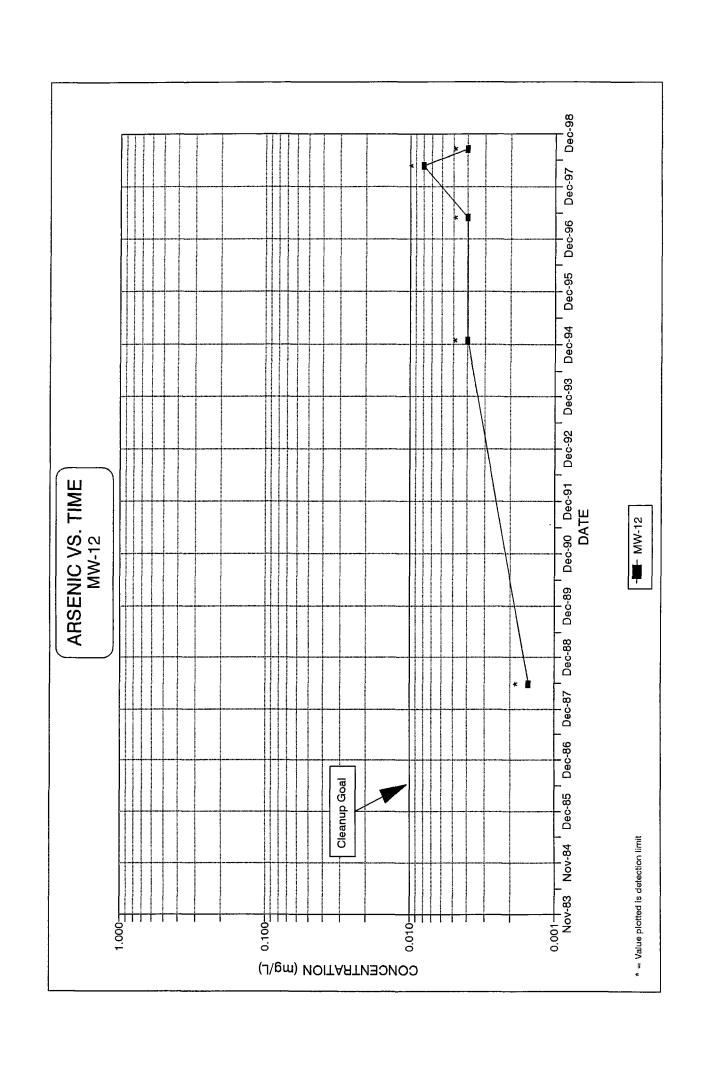


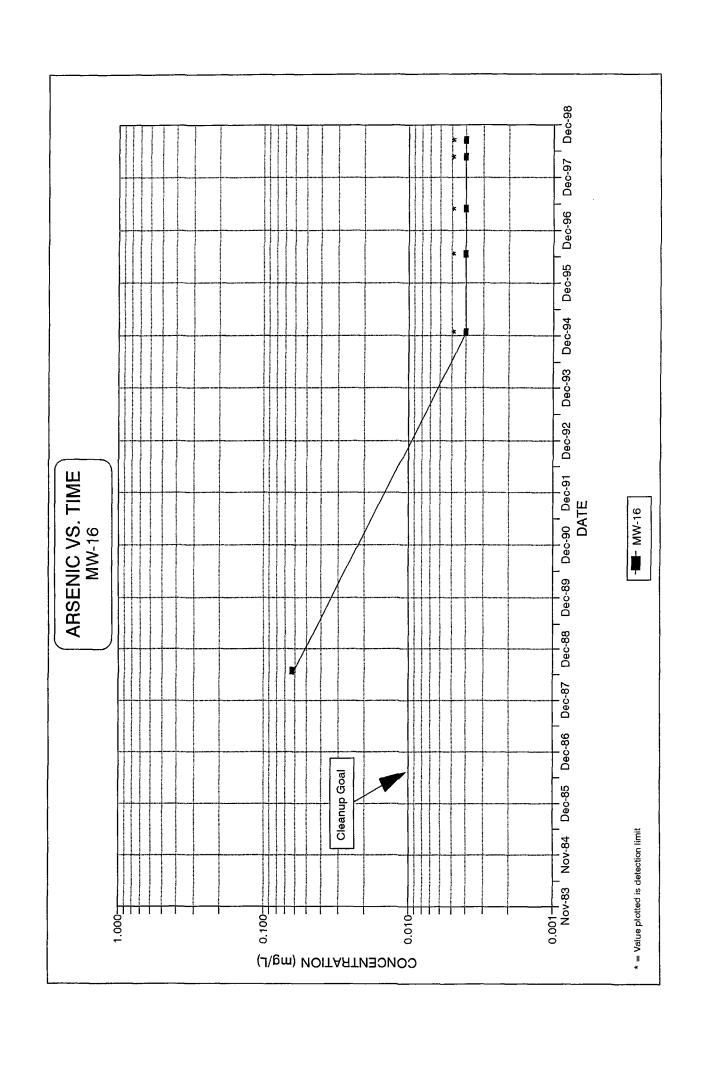
APPENDIX D-3

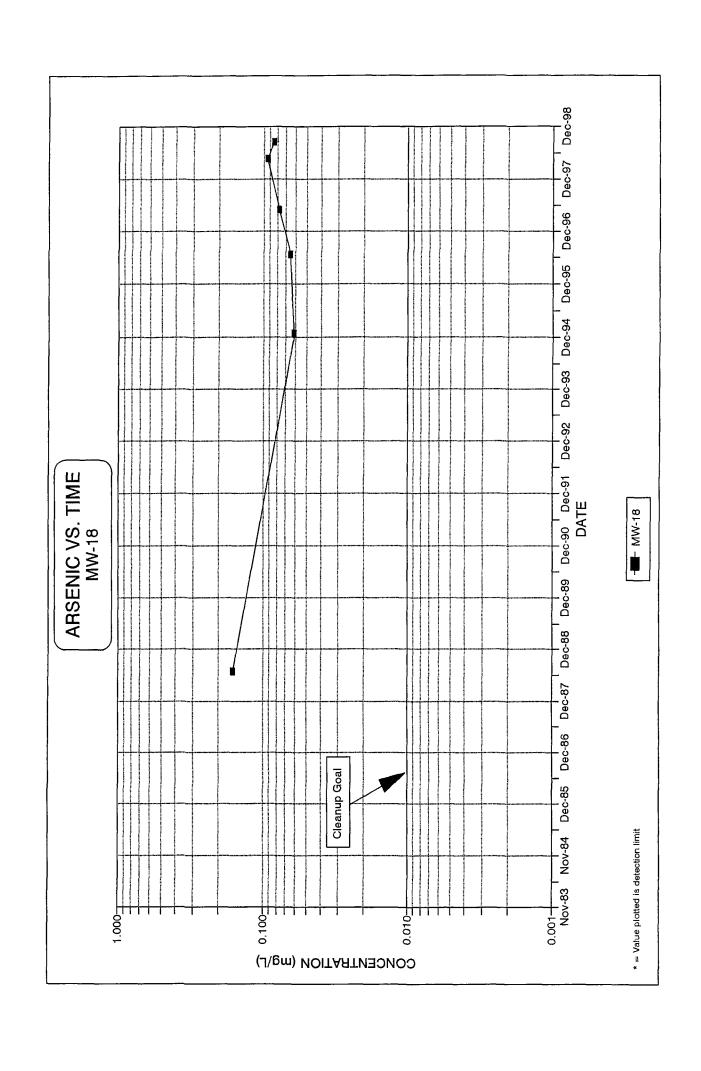
ARSENIC

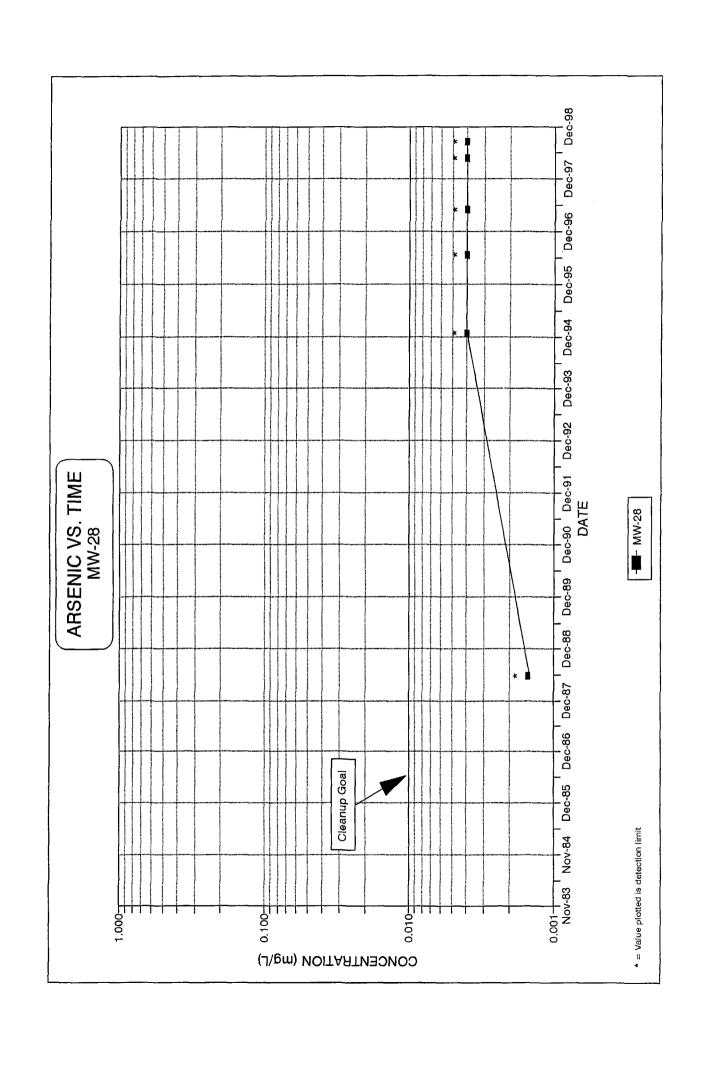


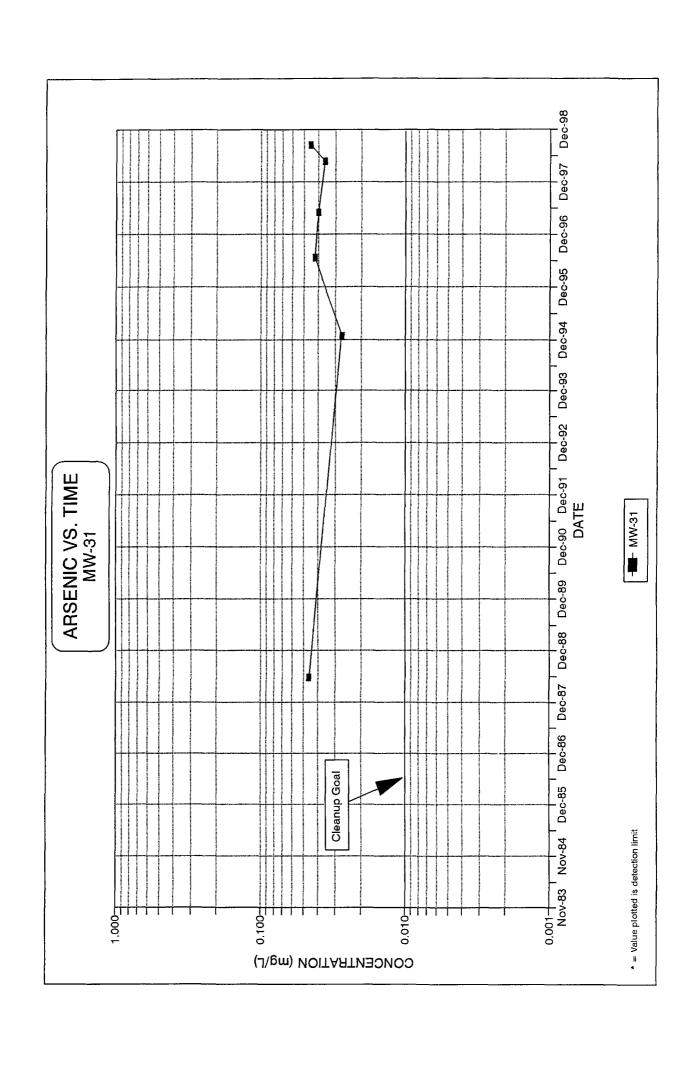


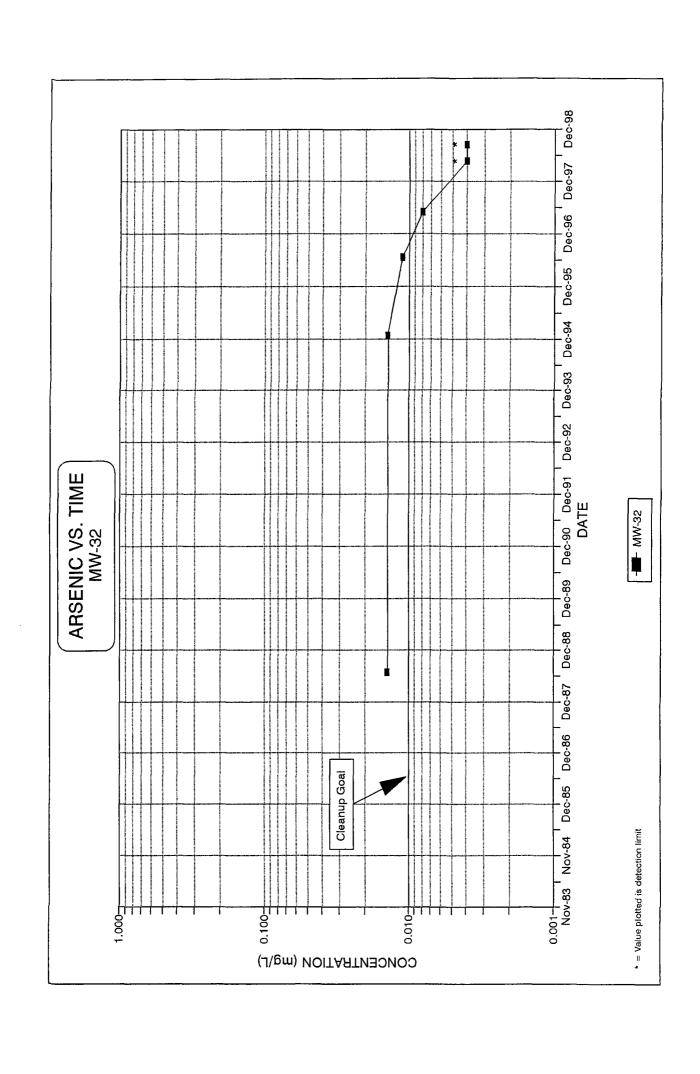


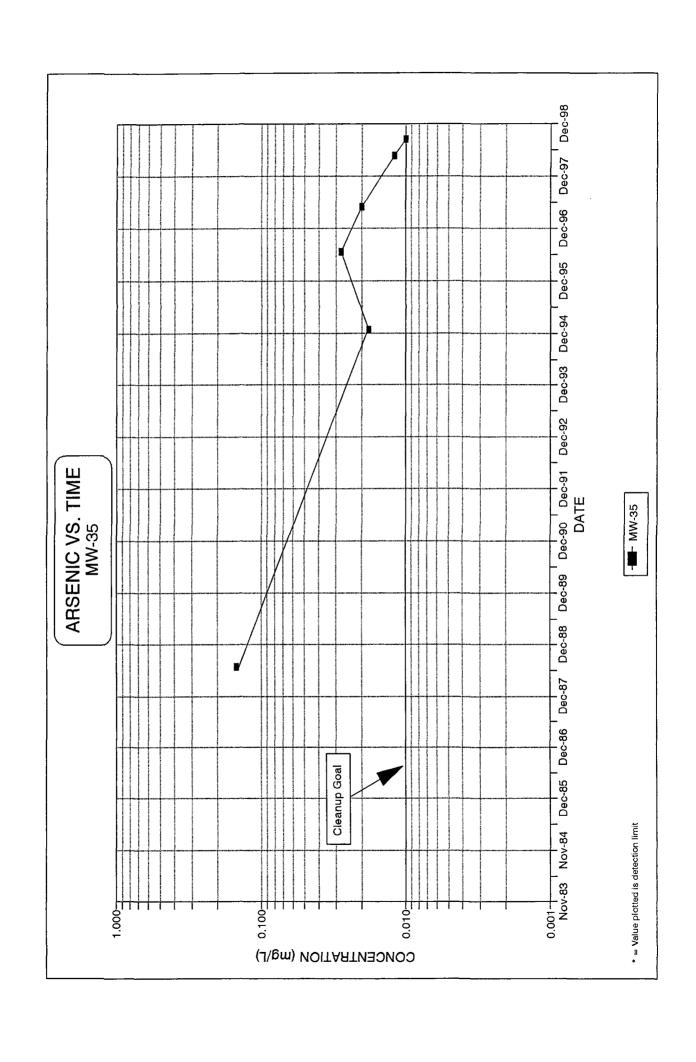


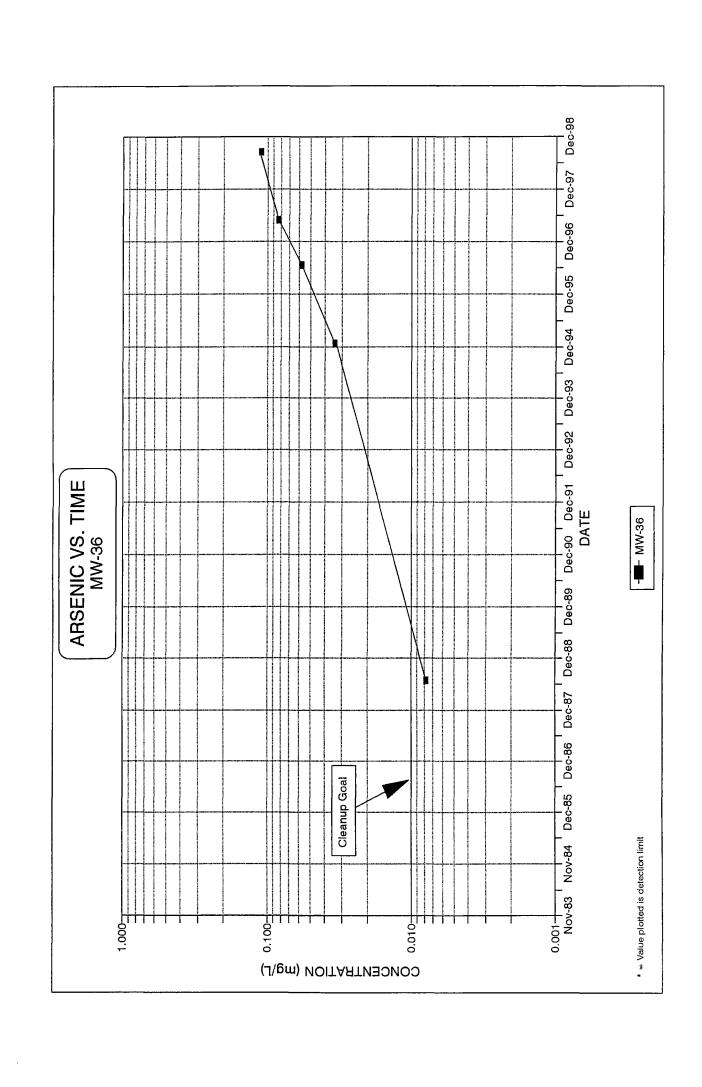


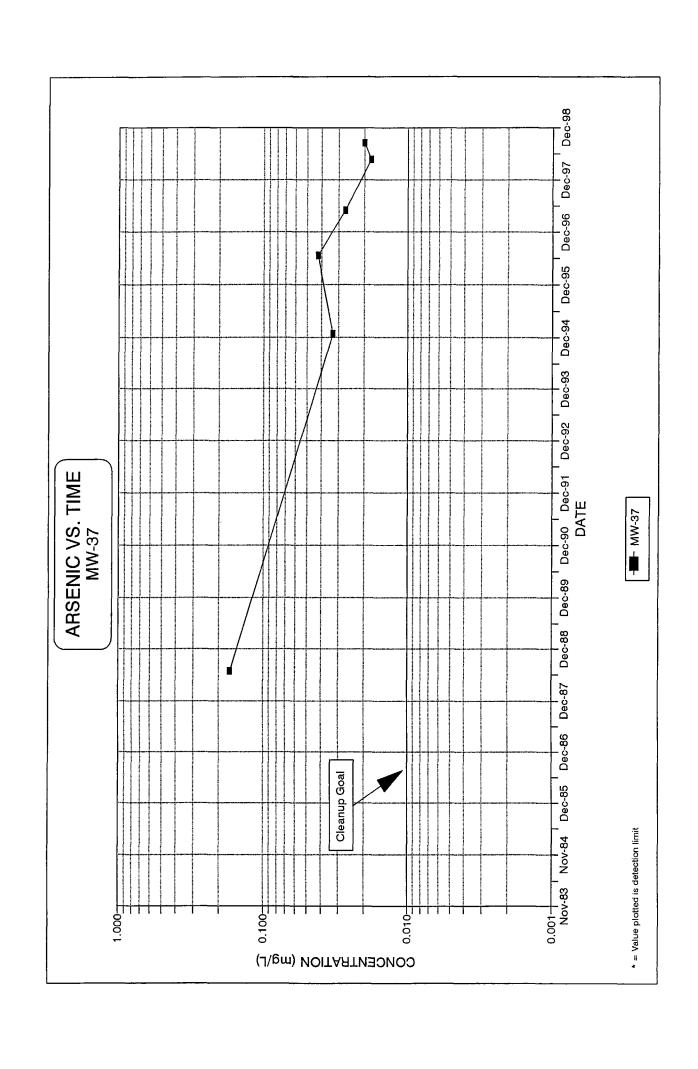








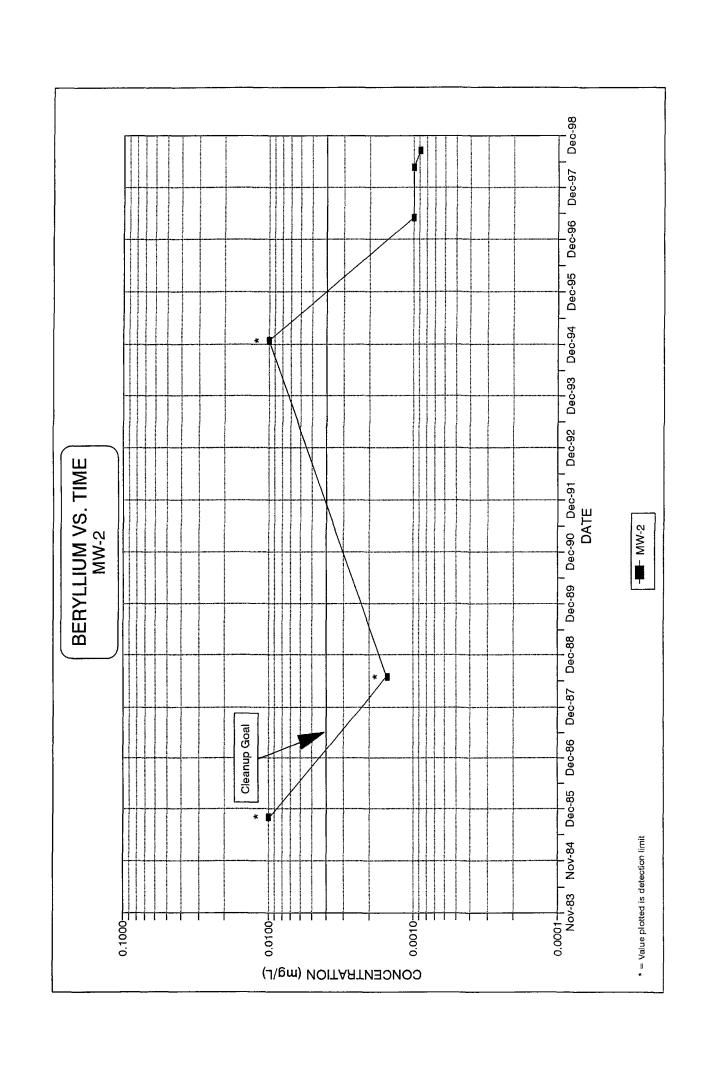


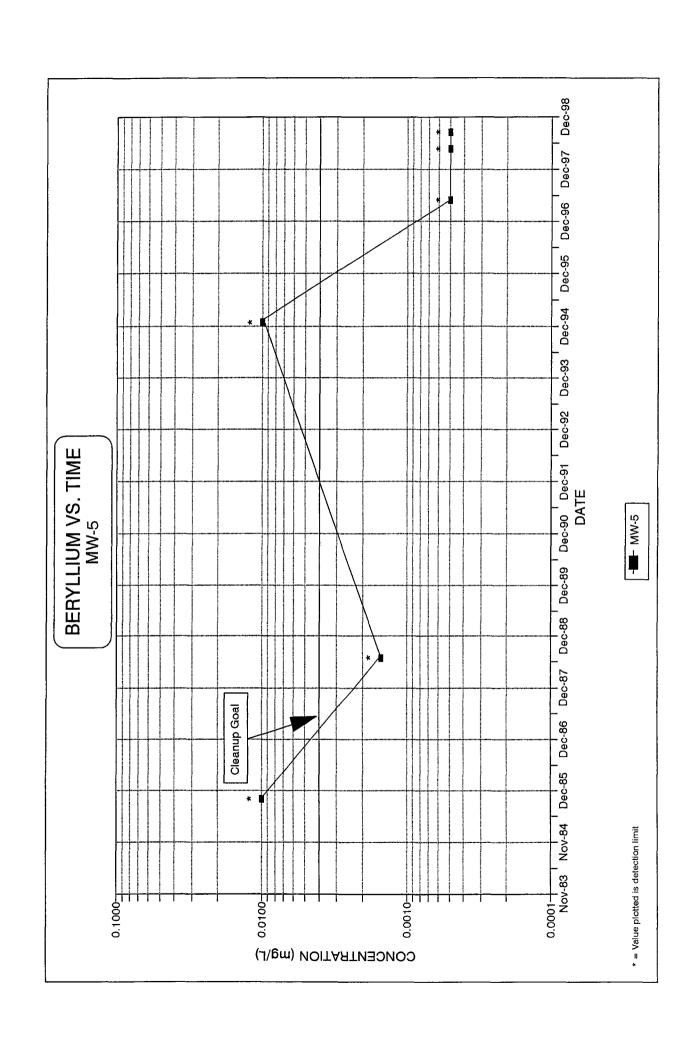


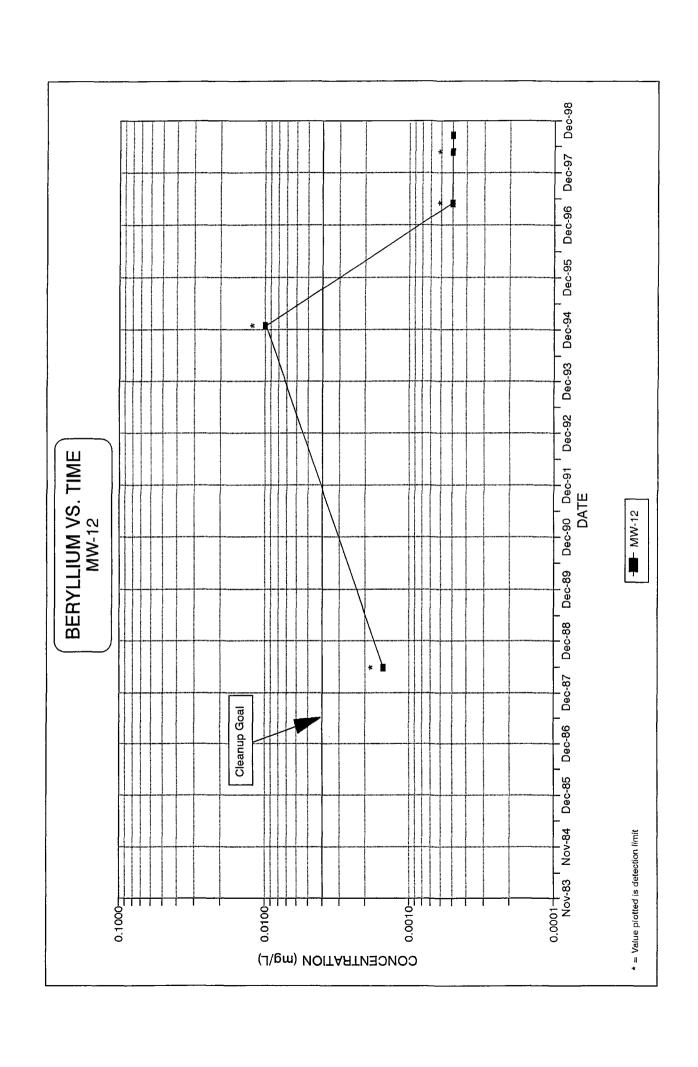
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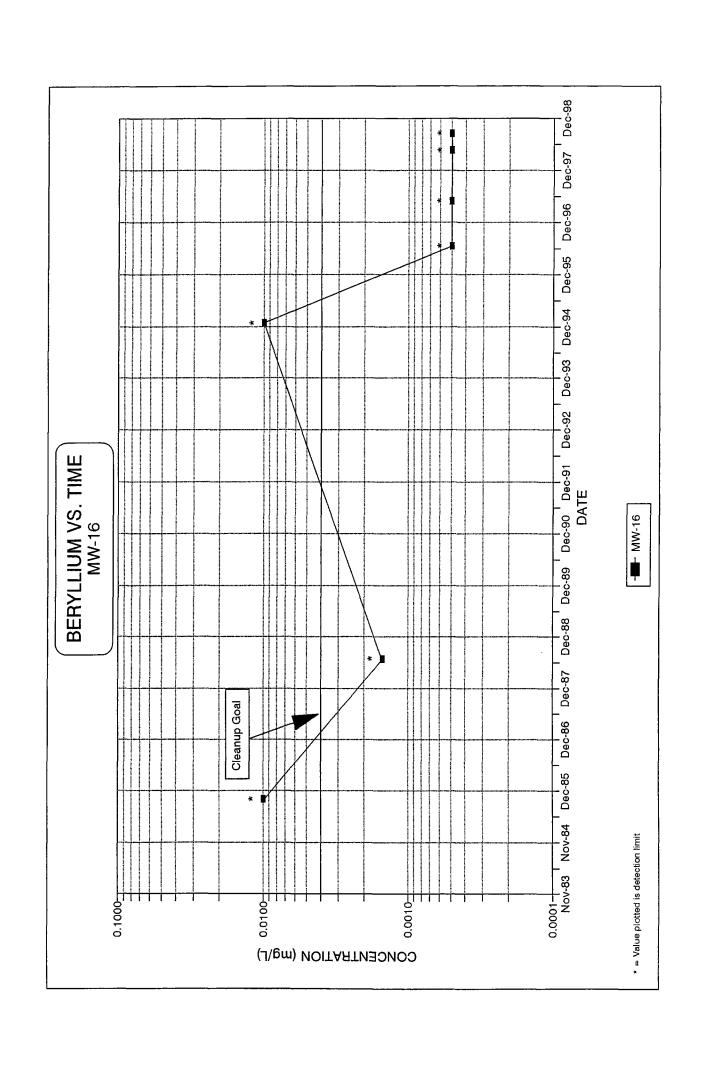
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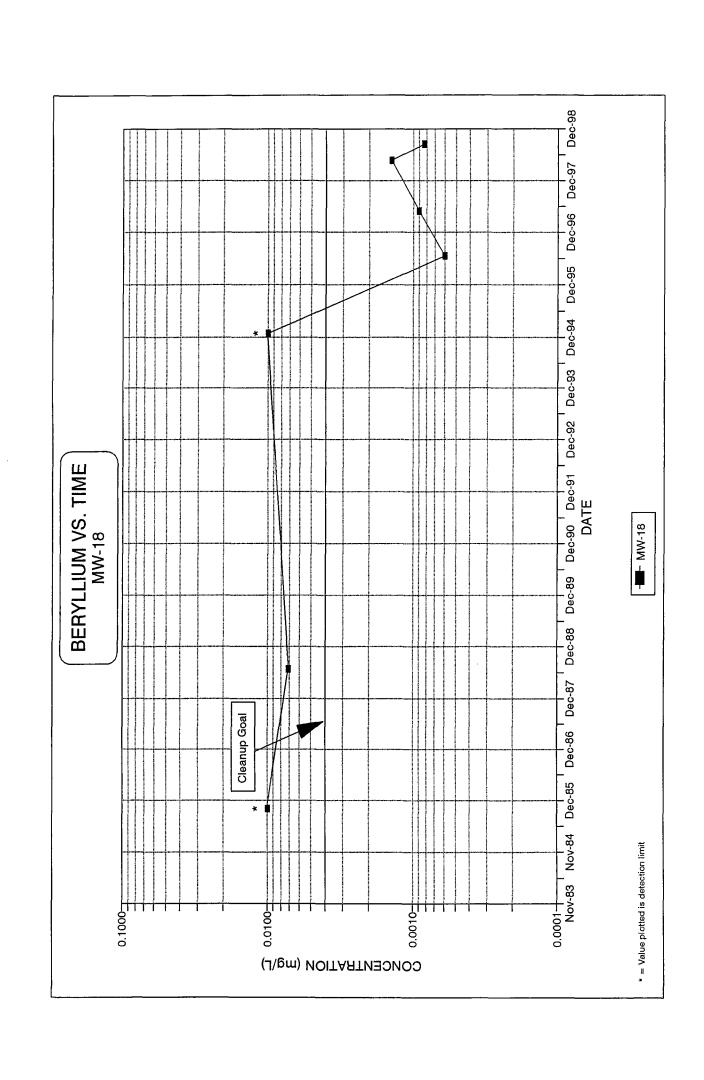
BERYLLIUM

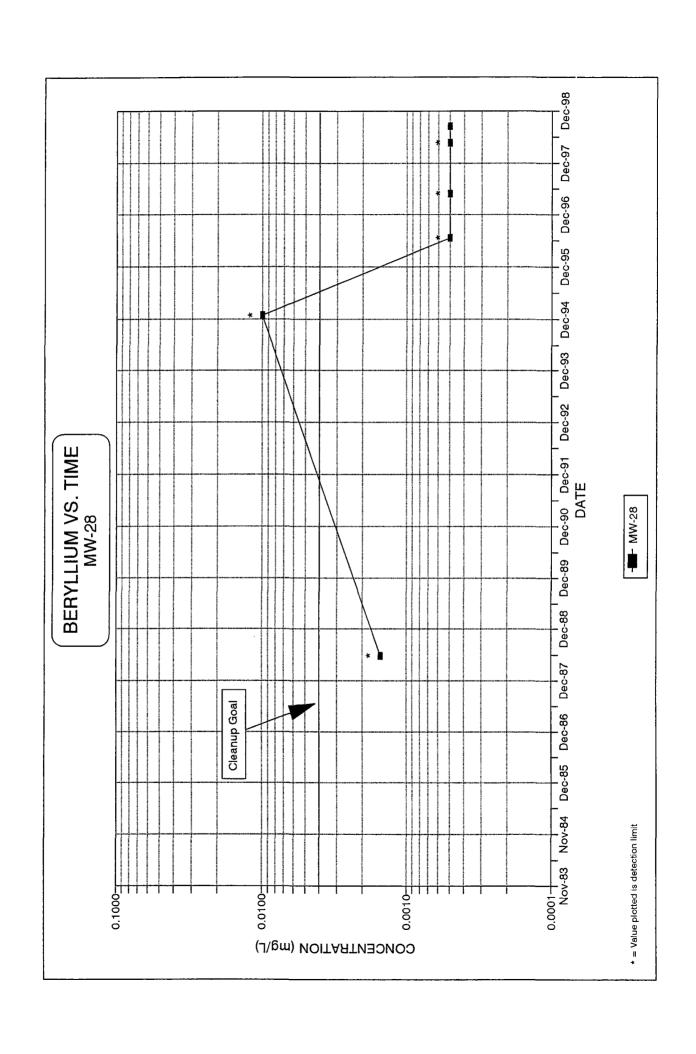


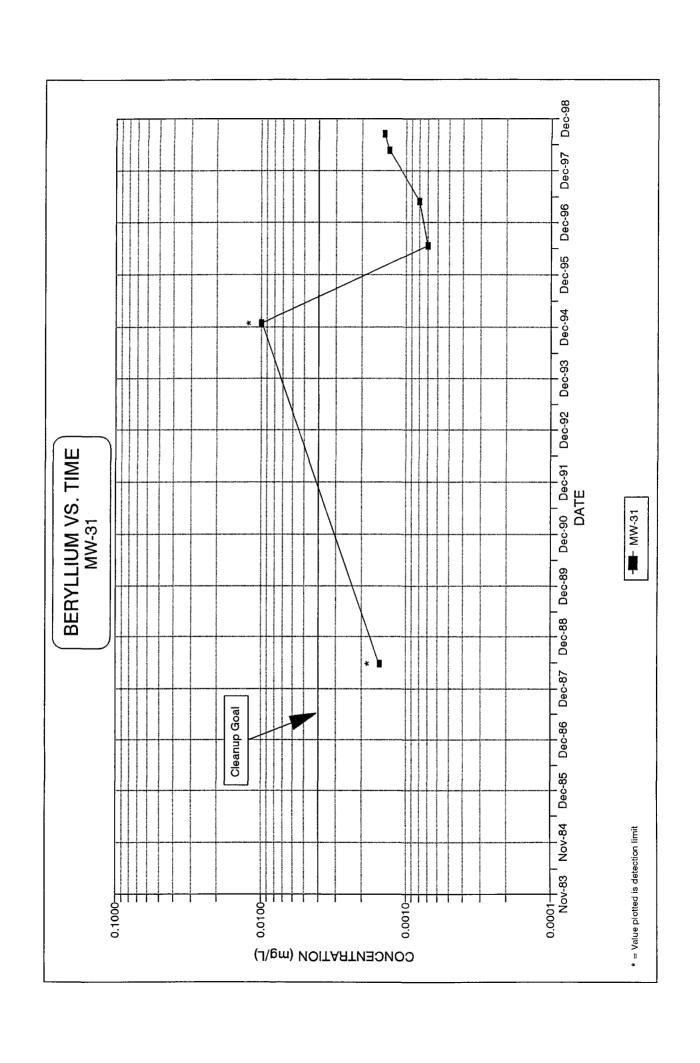


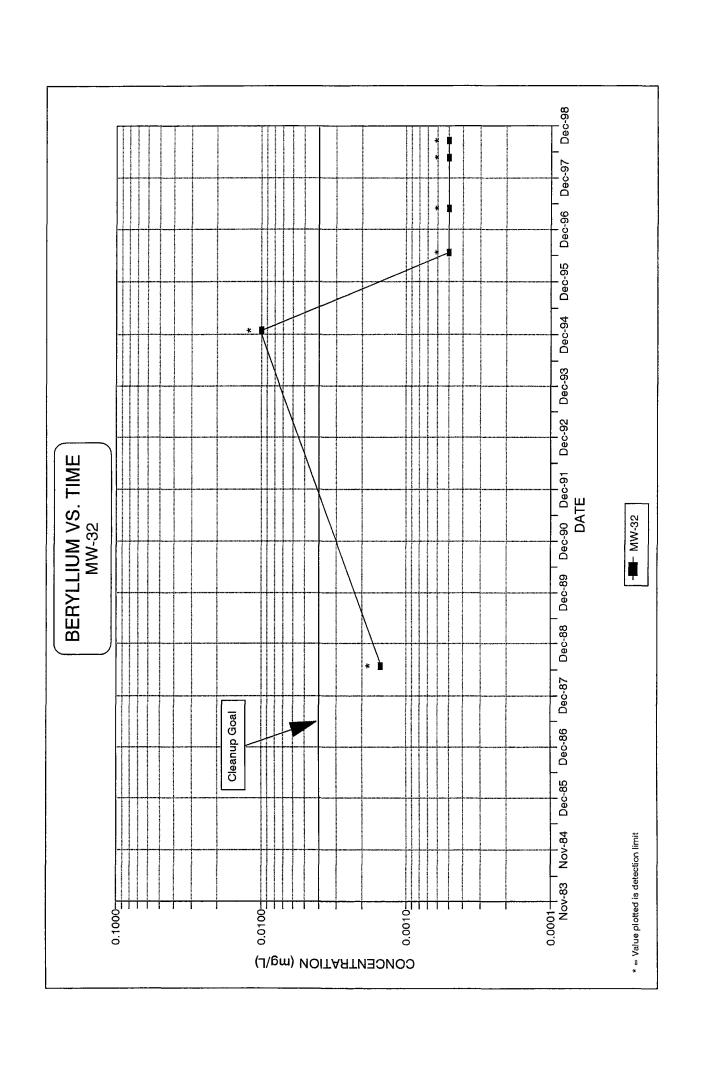


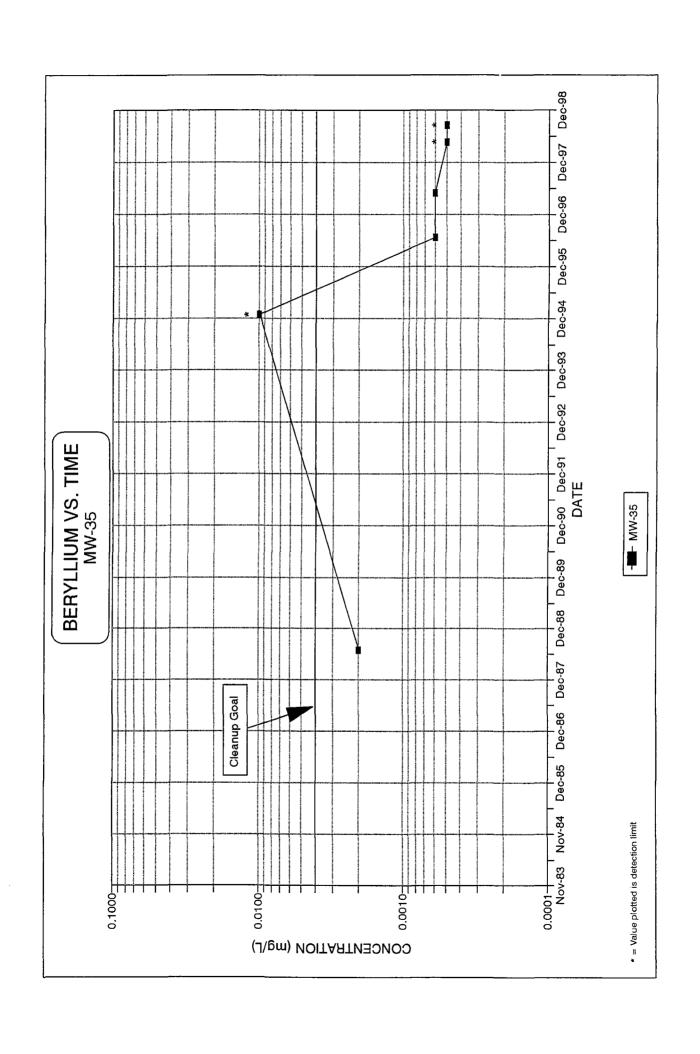


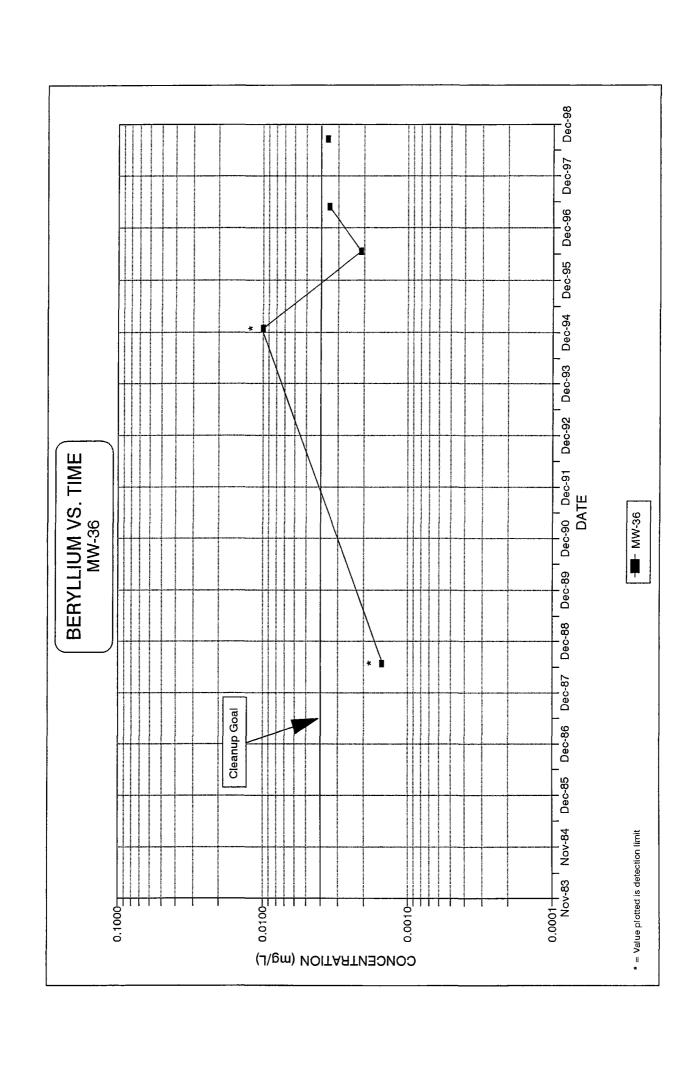


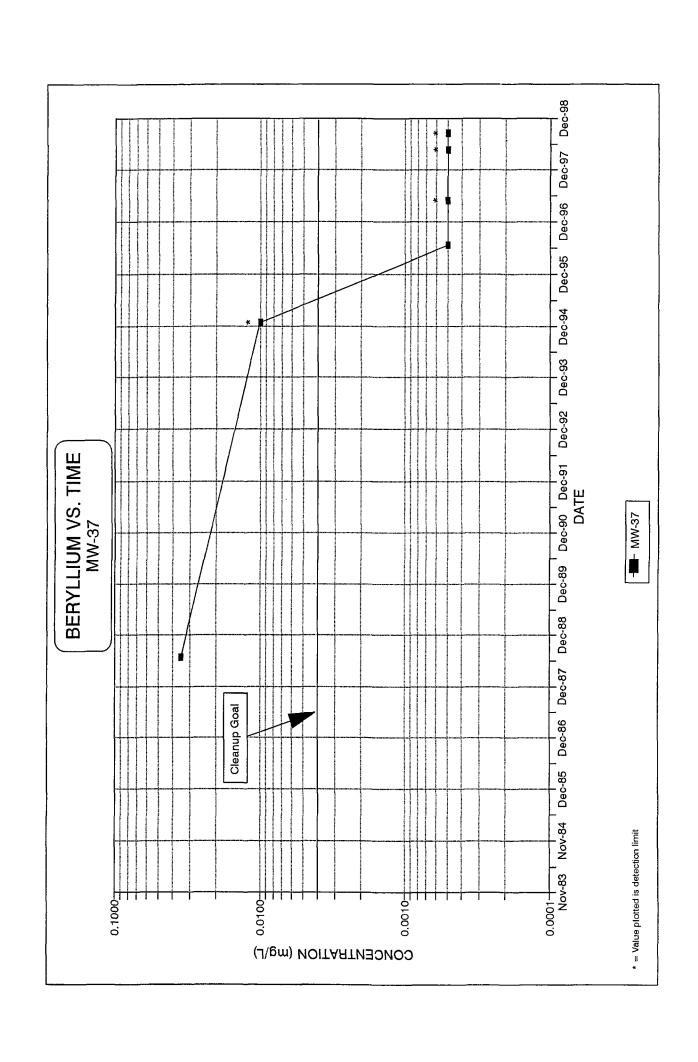








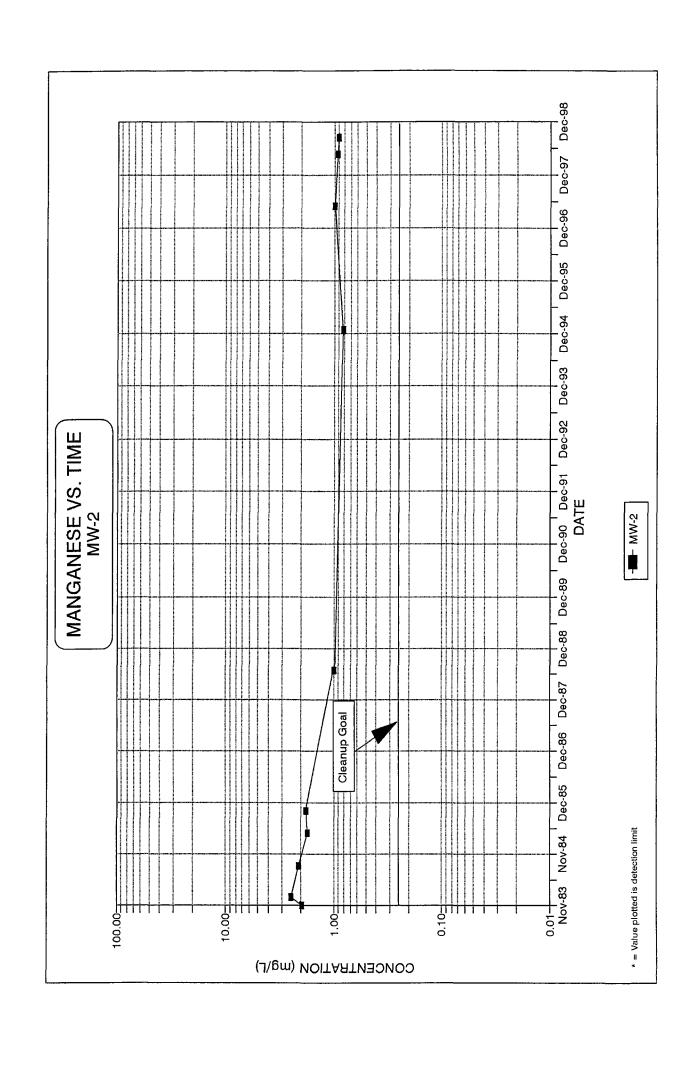


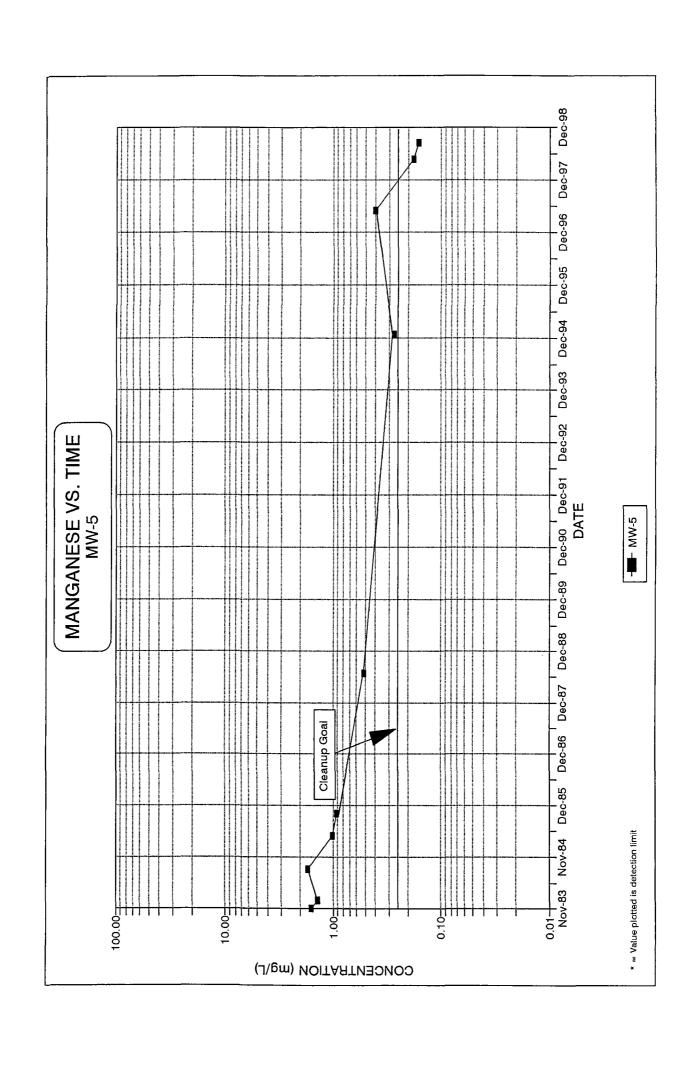


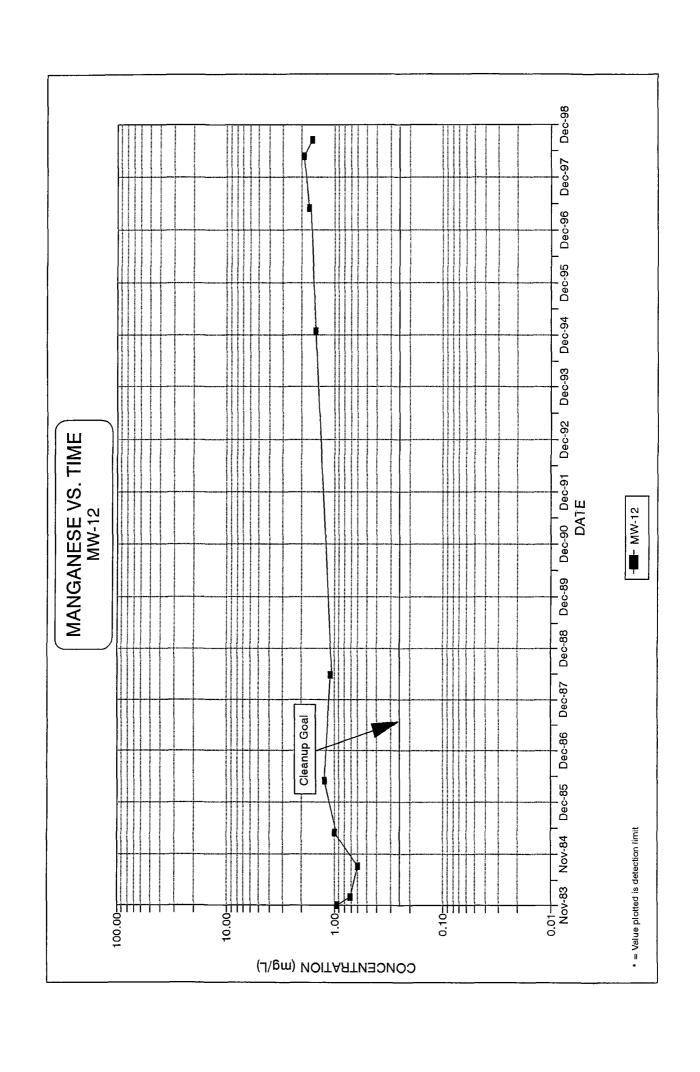
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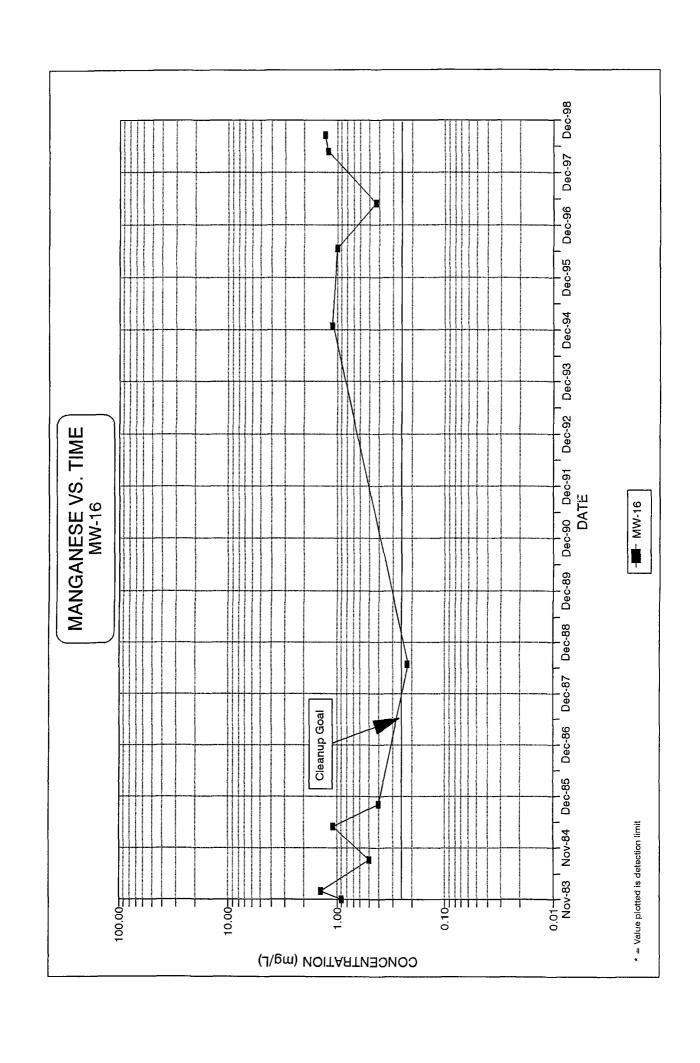
APPENDIX D-5

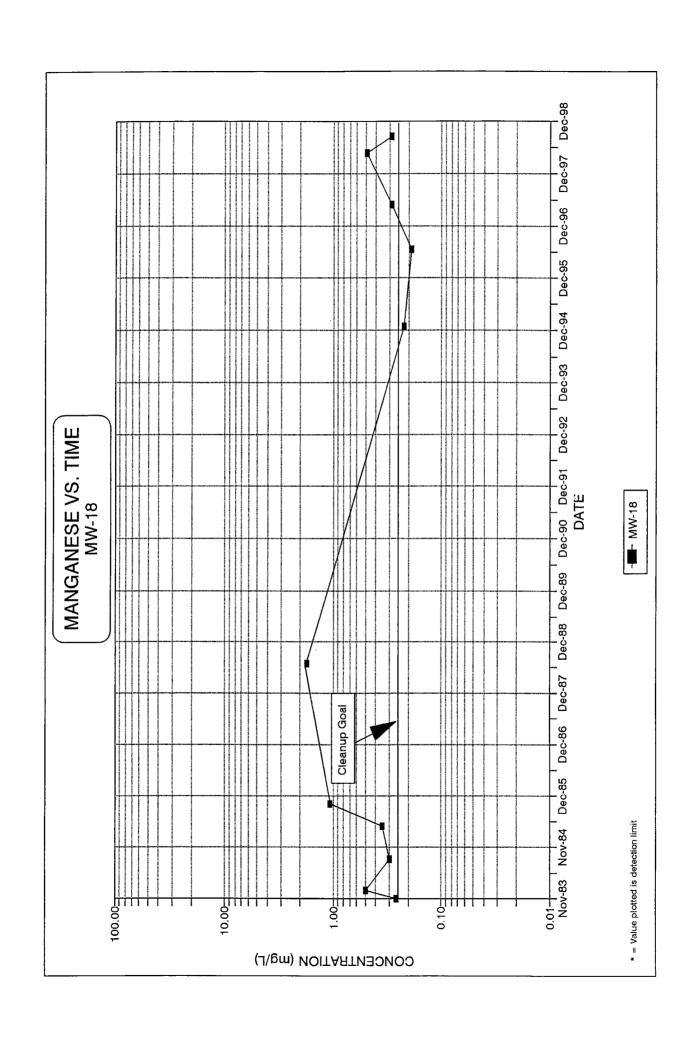
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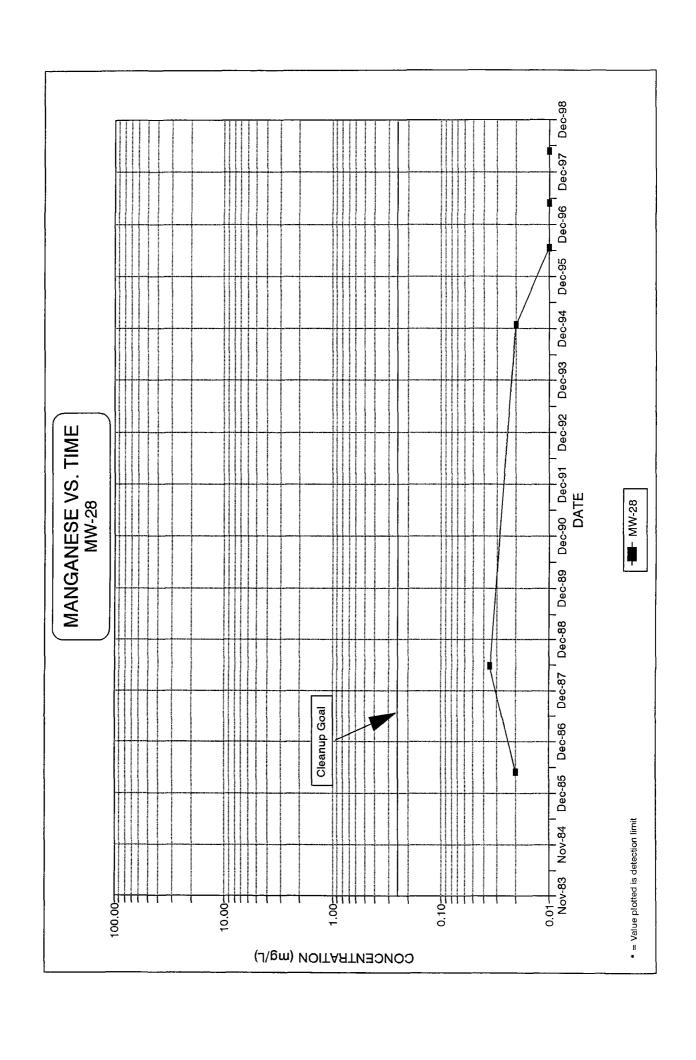


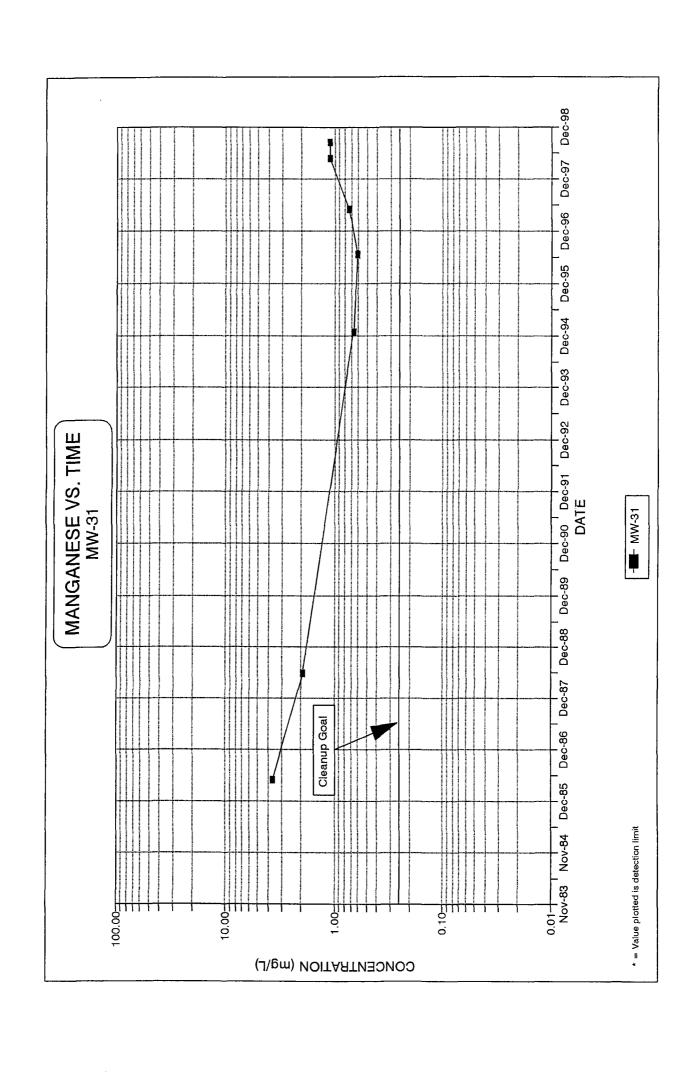


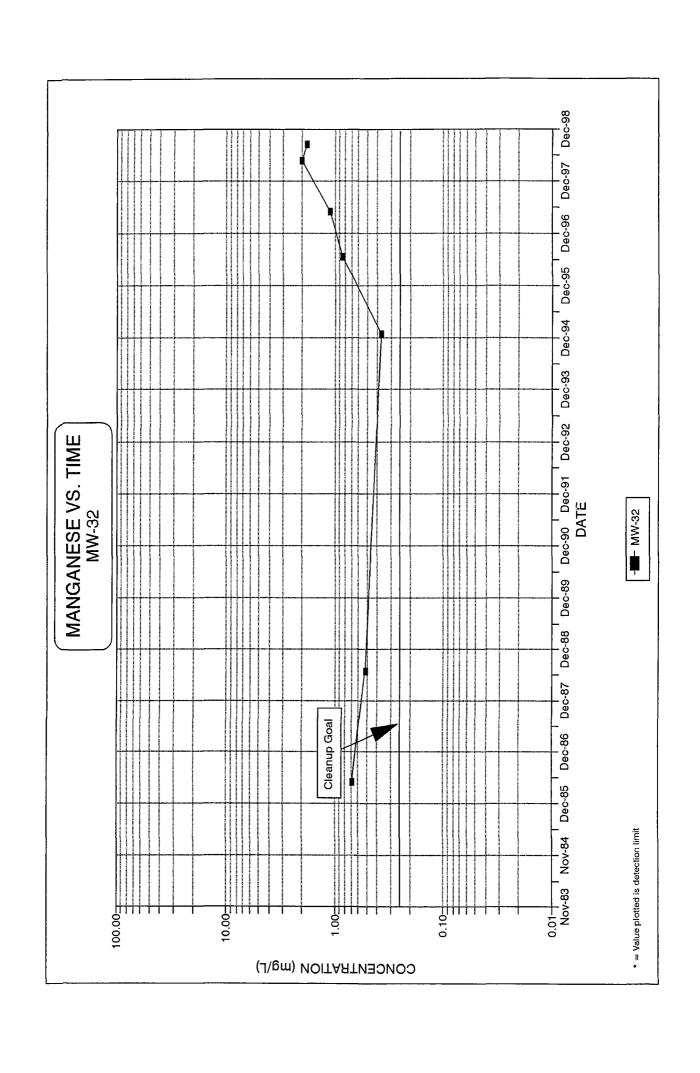


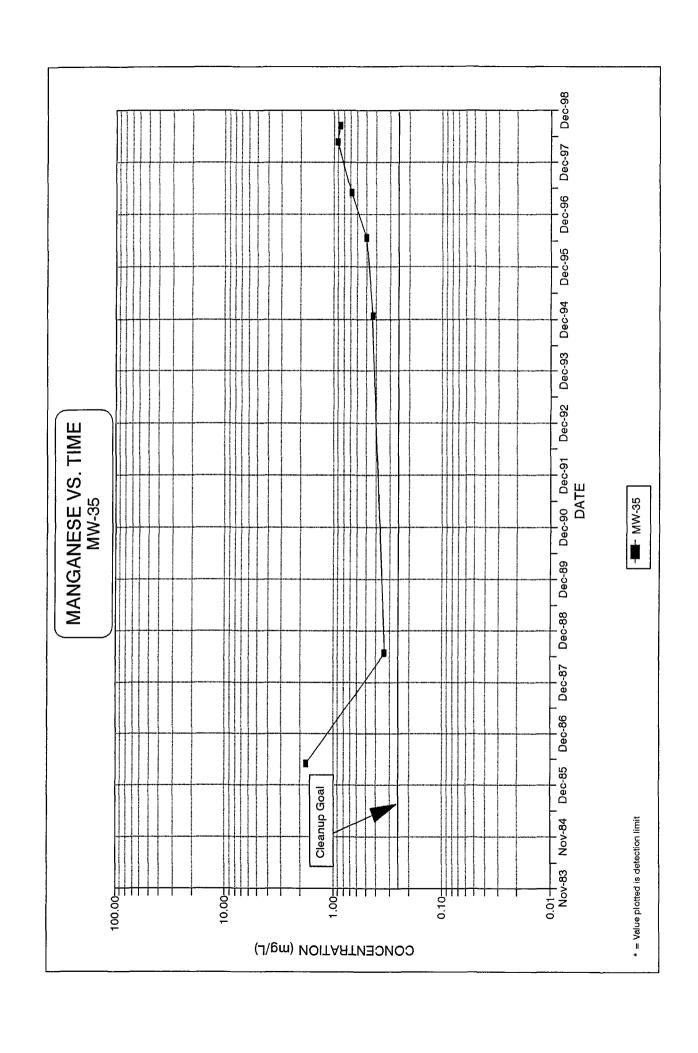


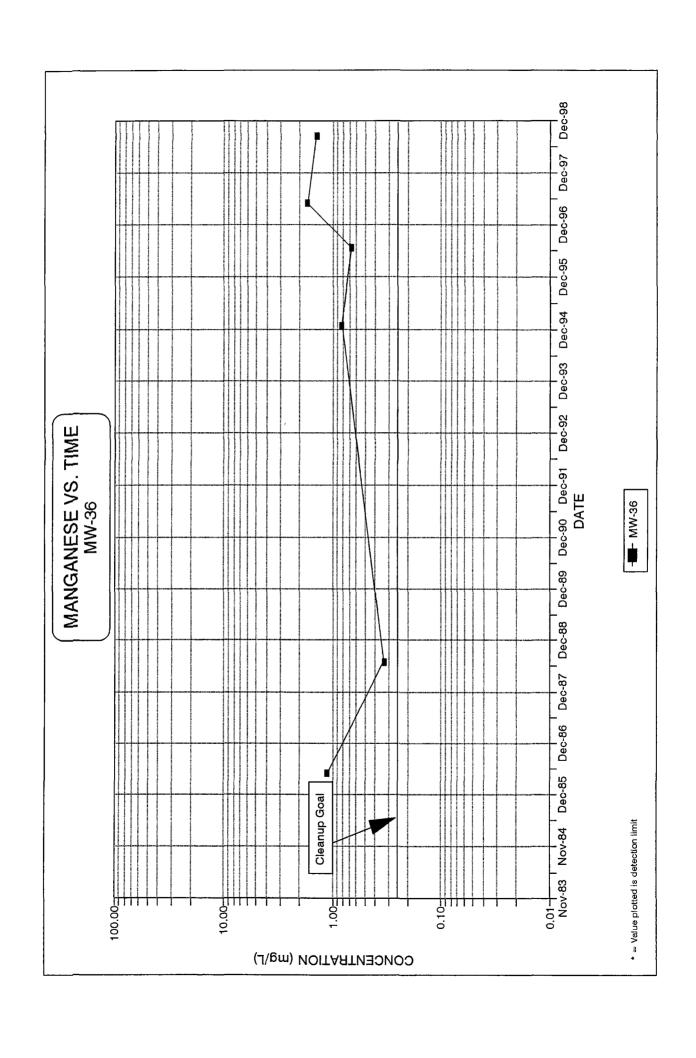


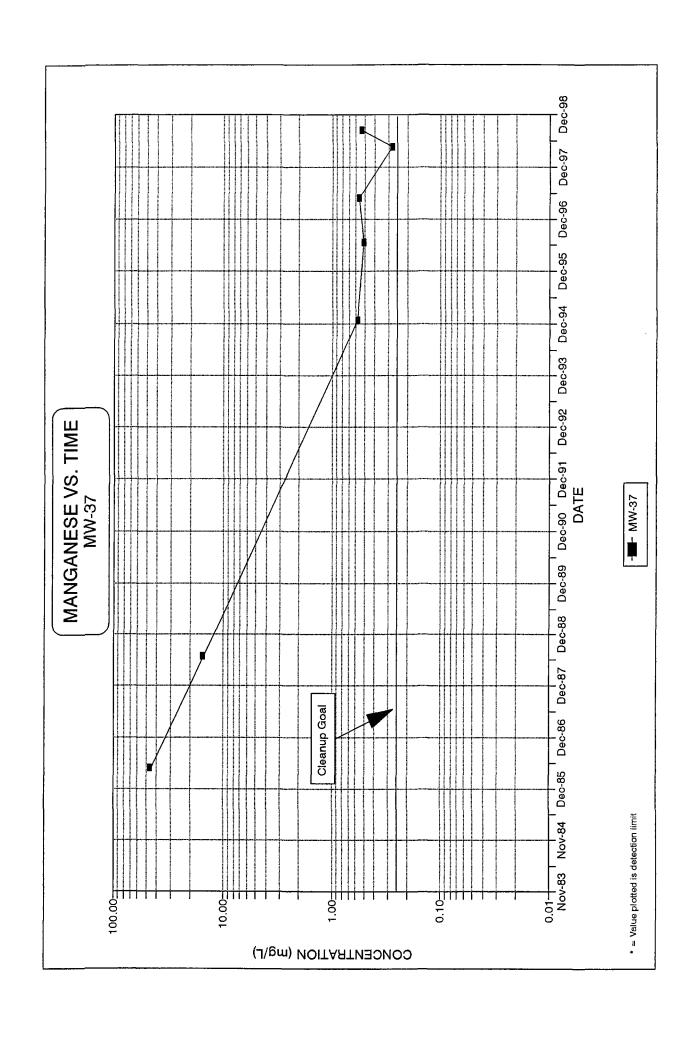






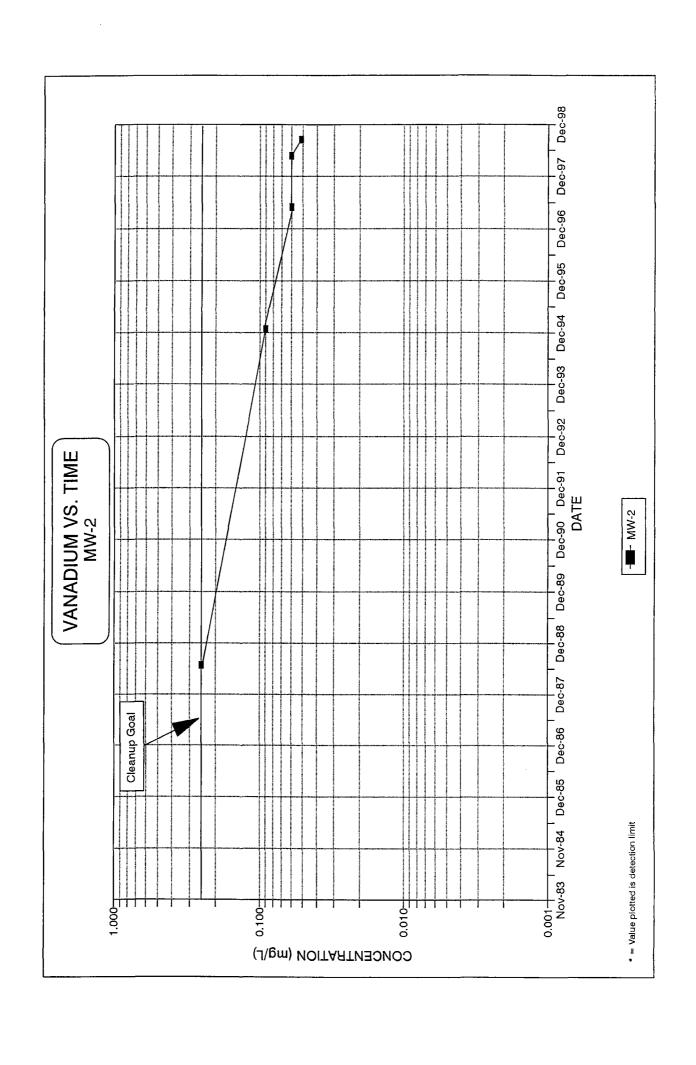


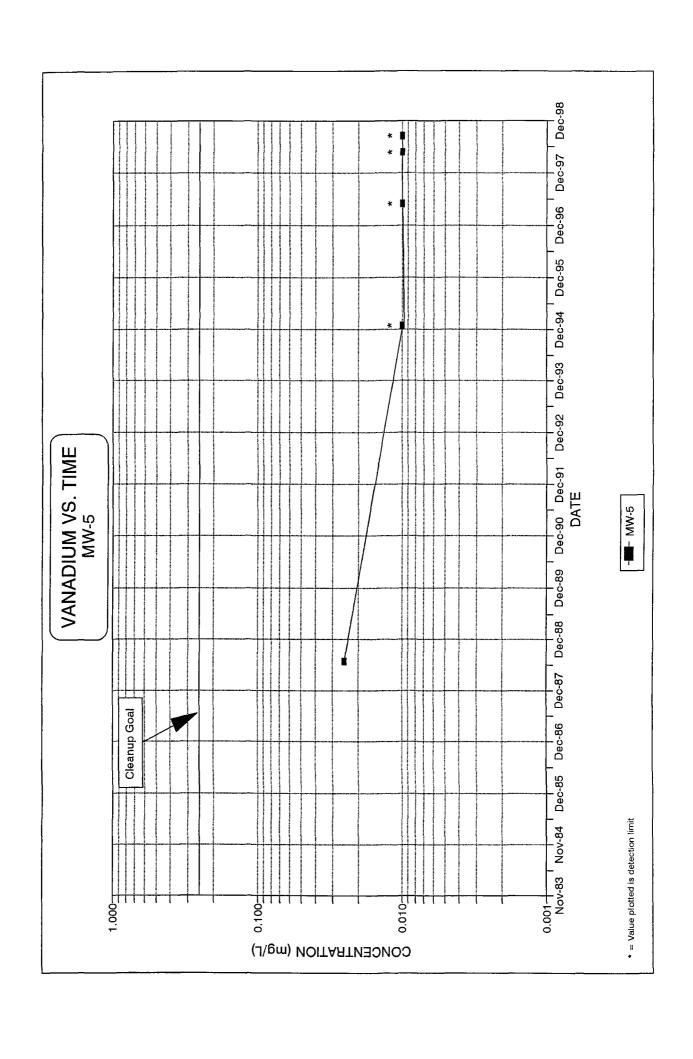


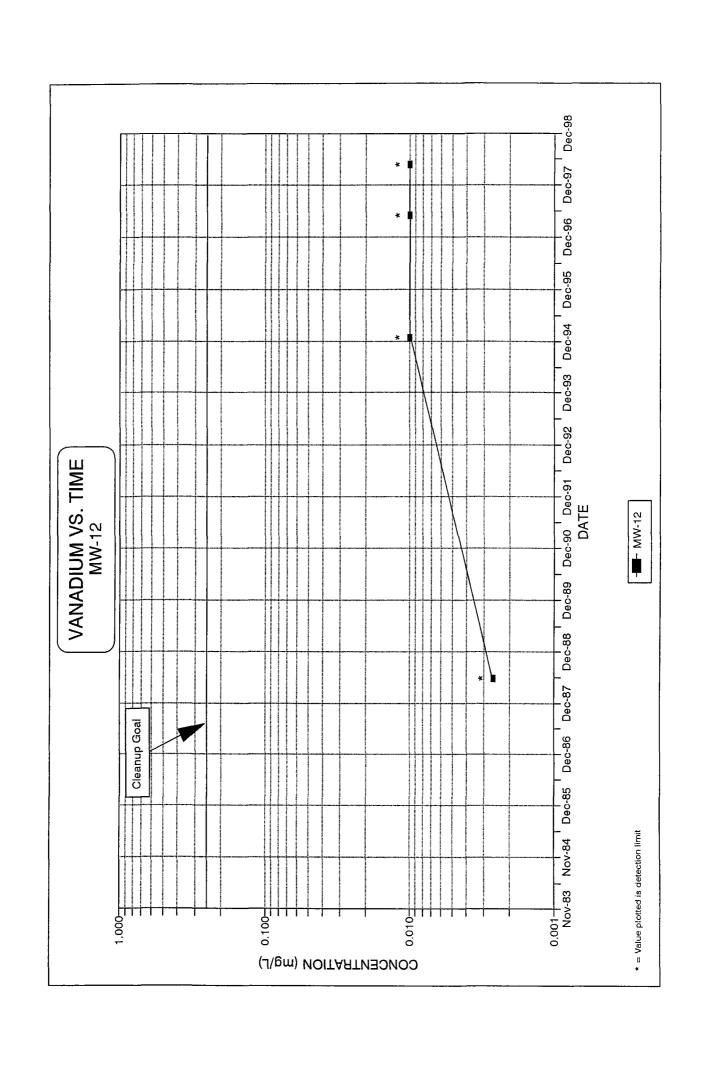


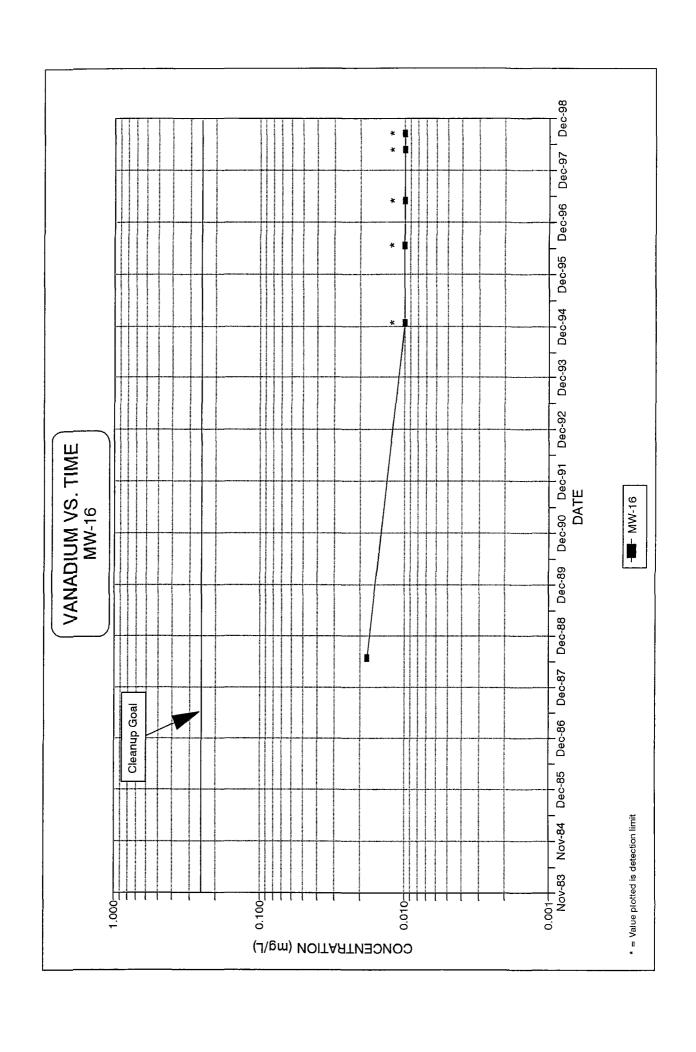
APPENDIX D-6

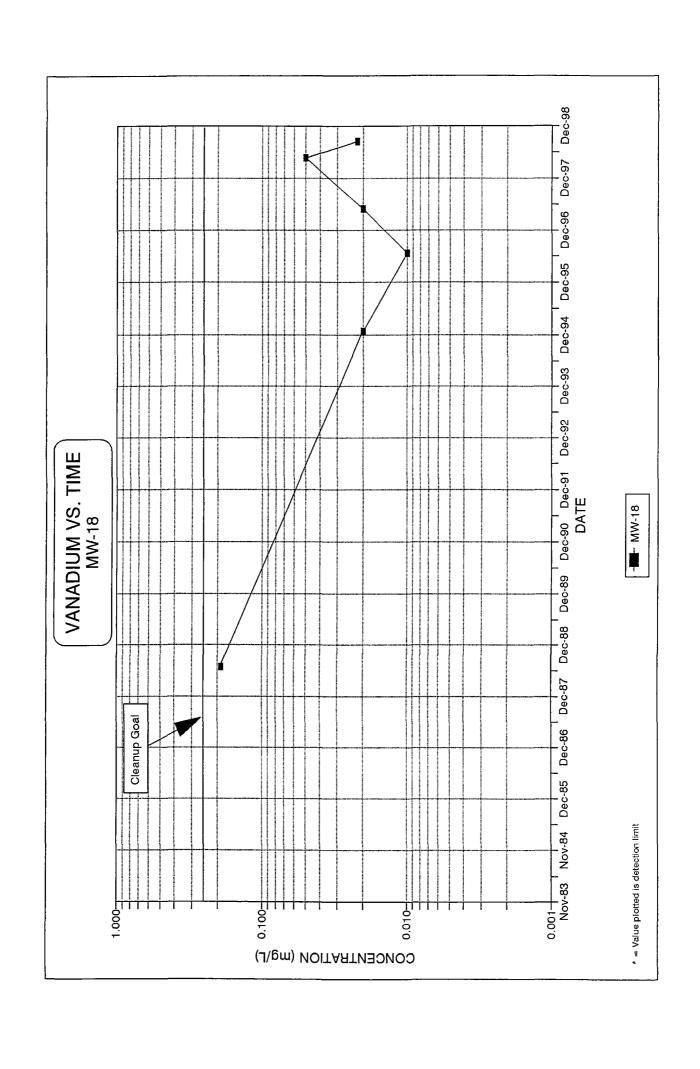
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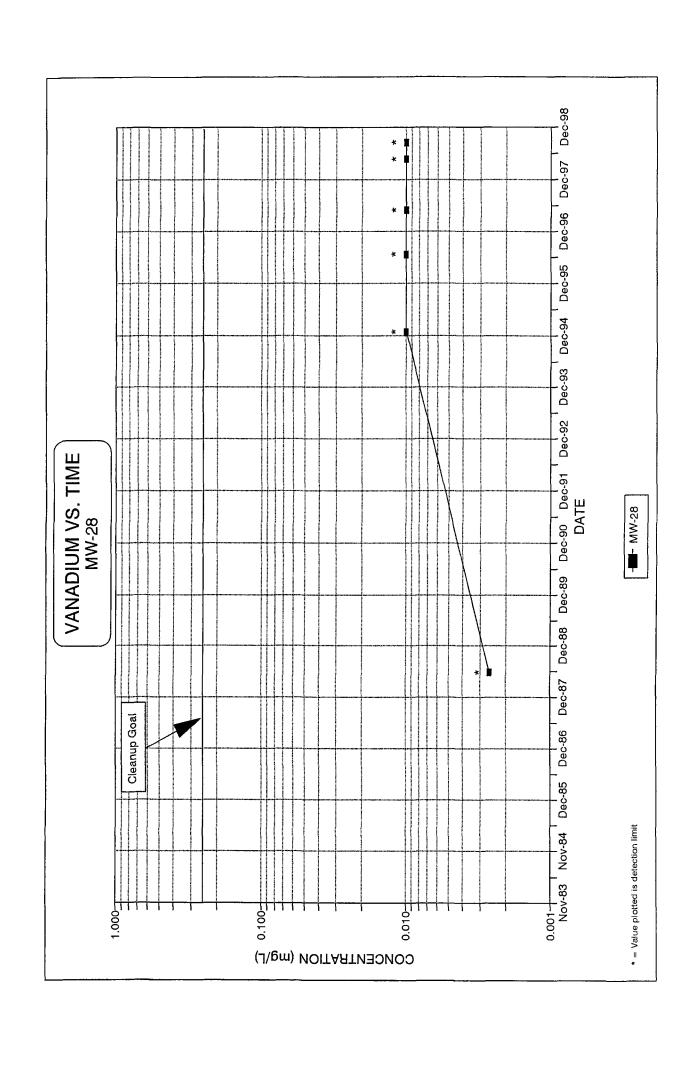


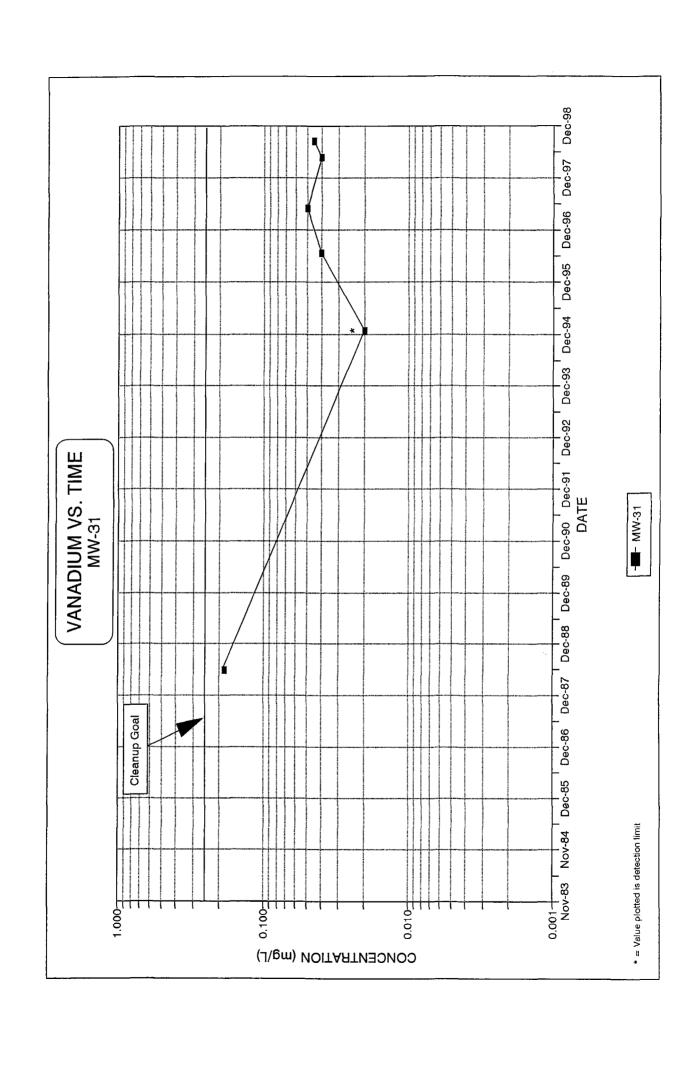


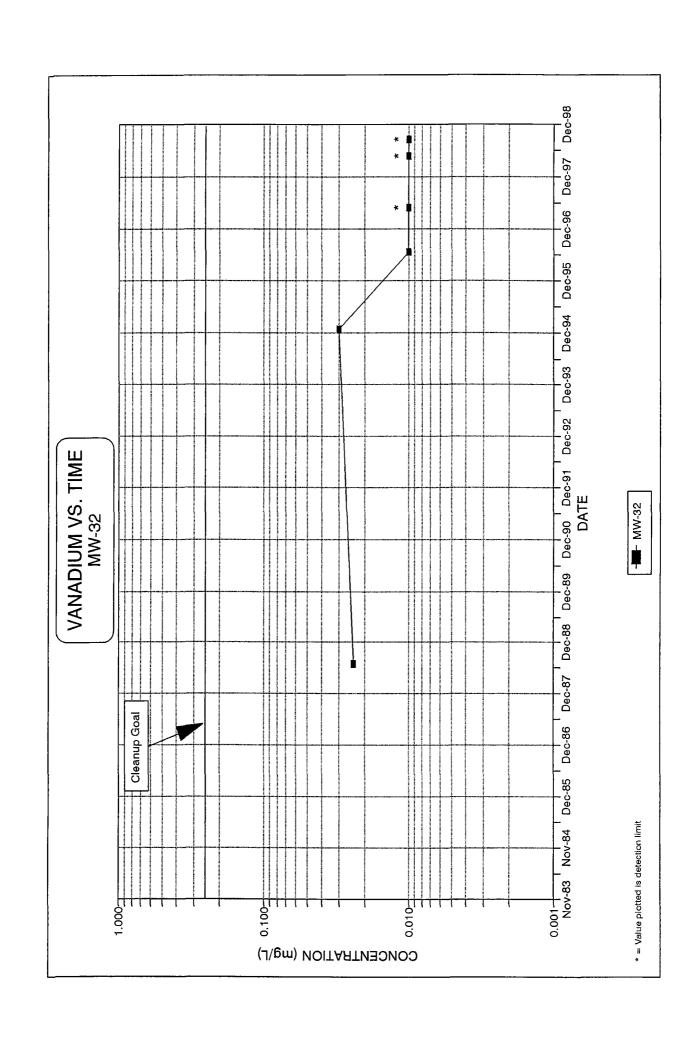


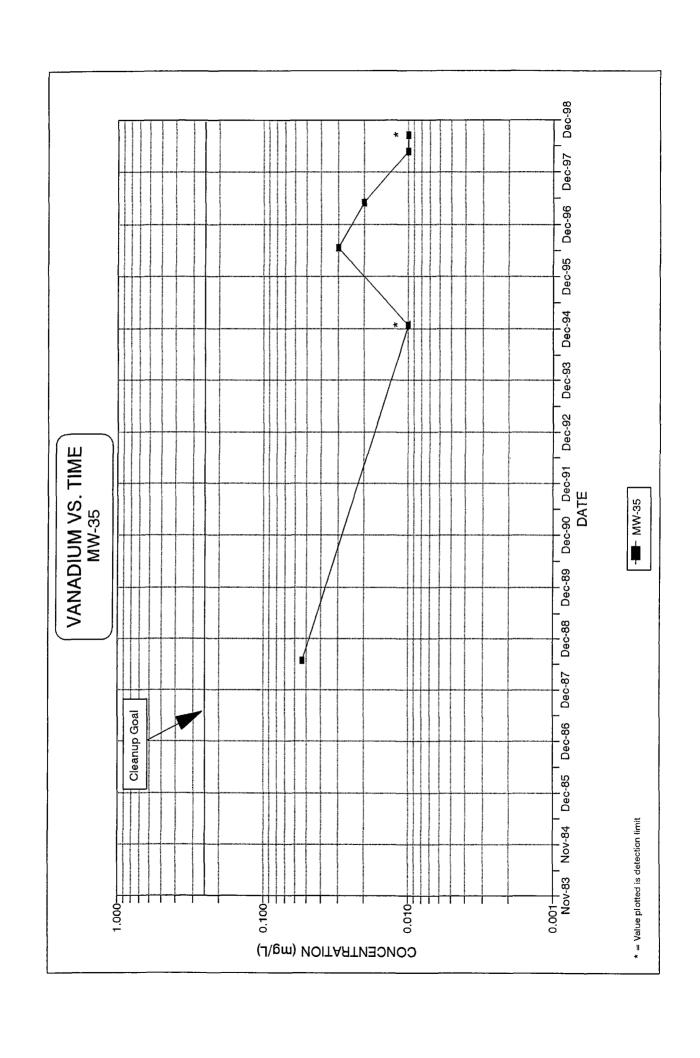


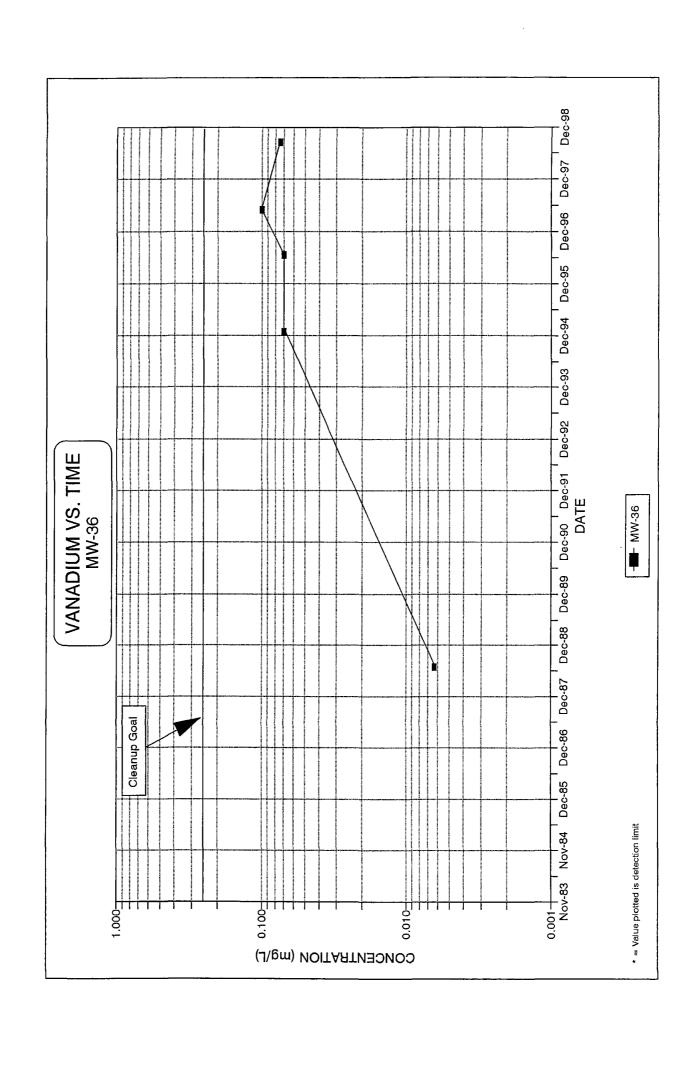


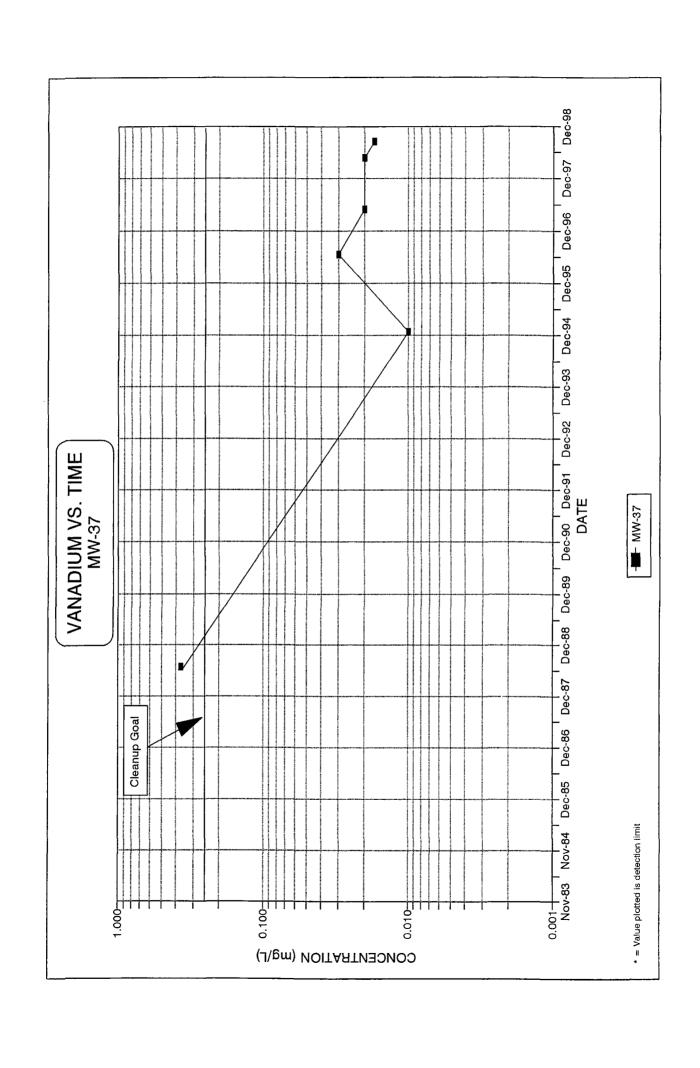








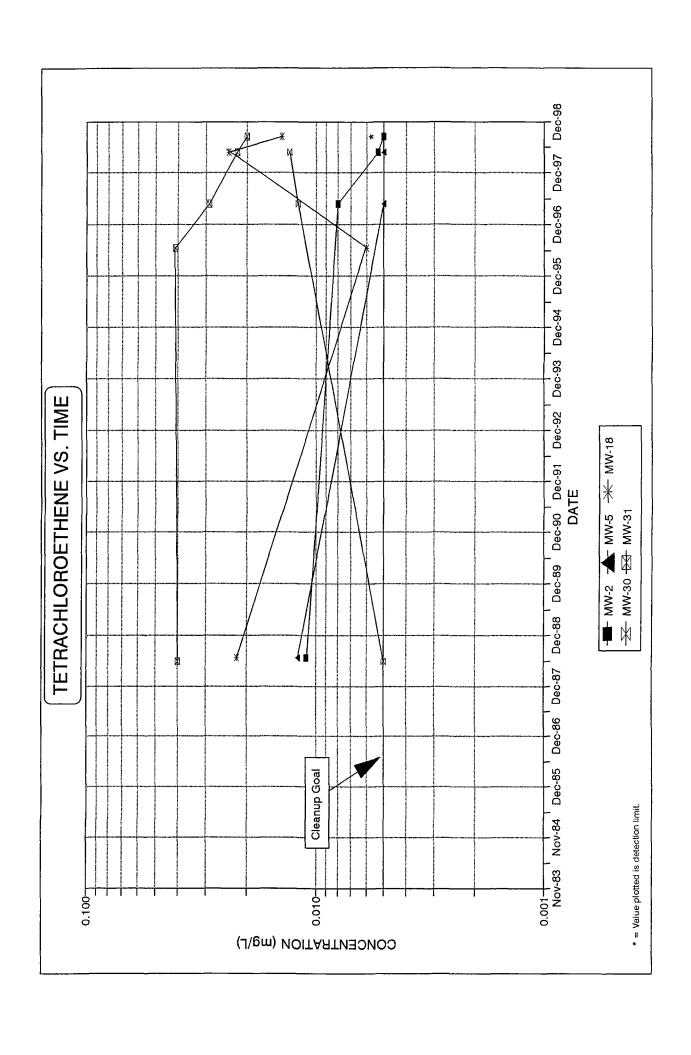




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APPENDIX D-7

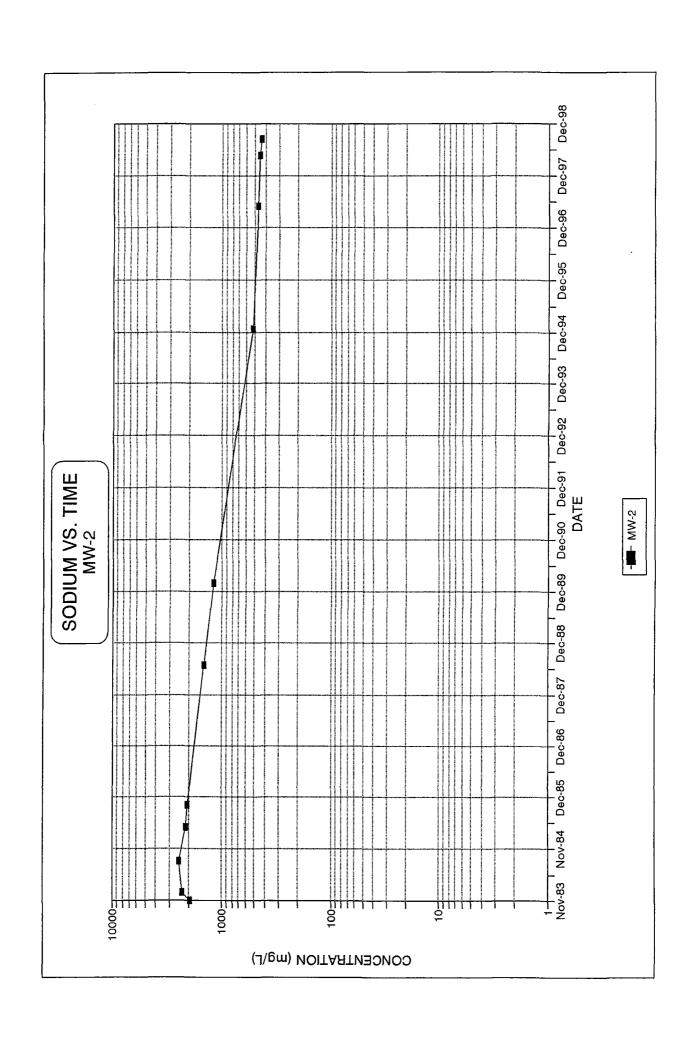
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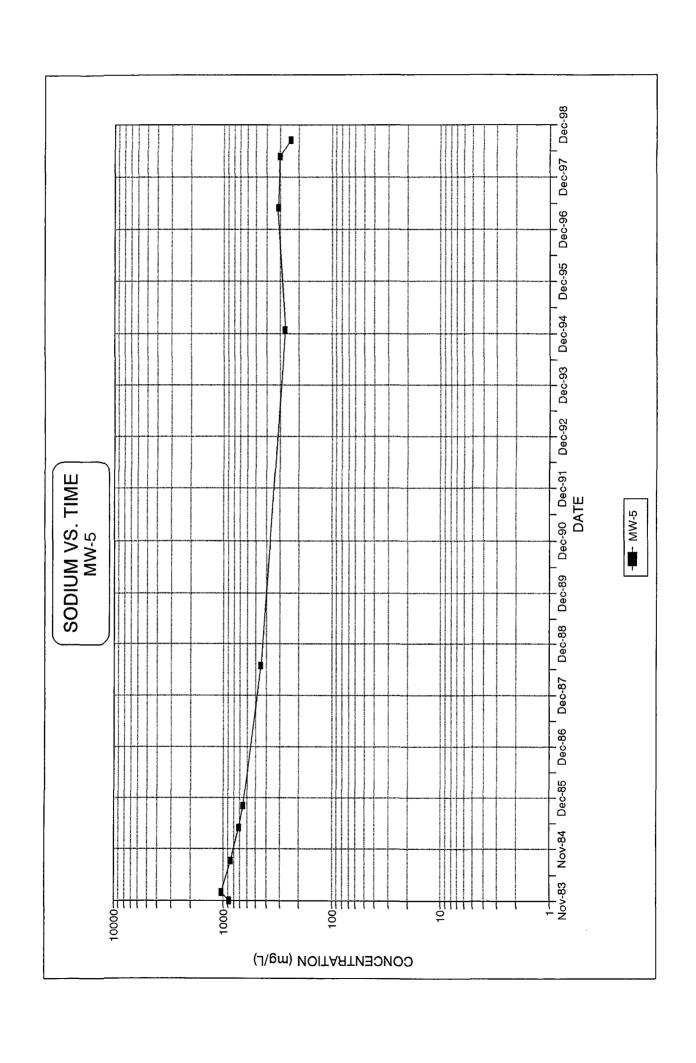


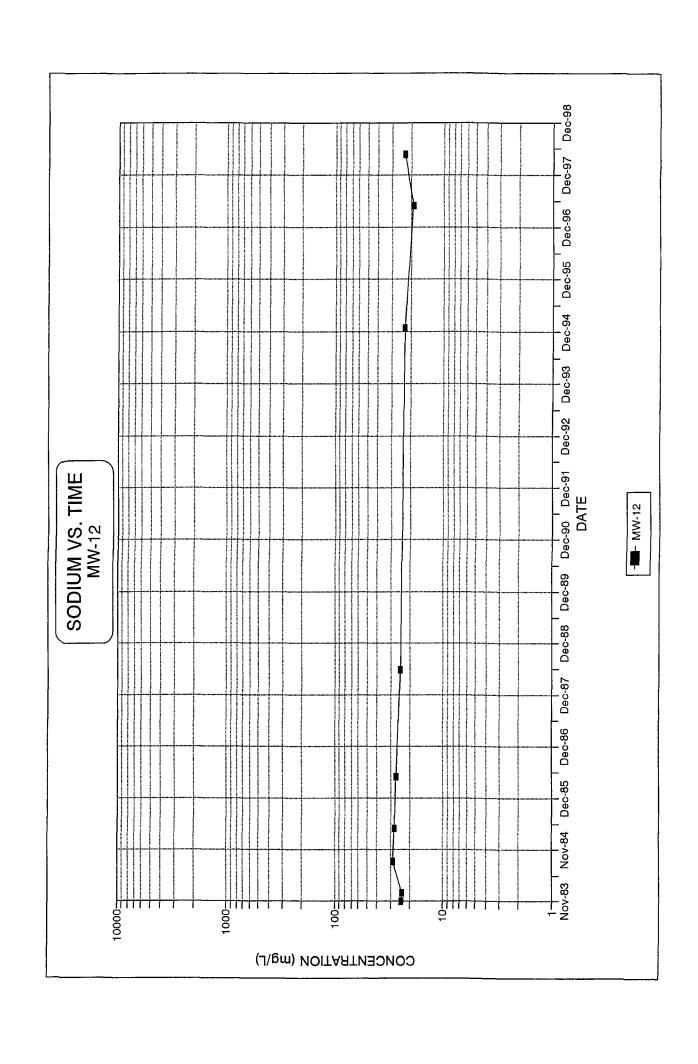
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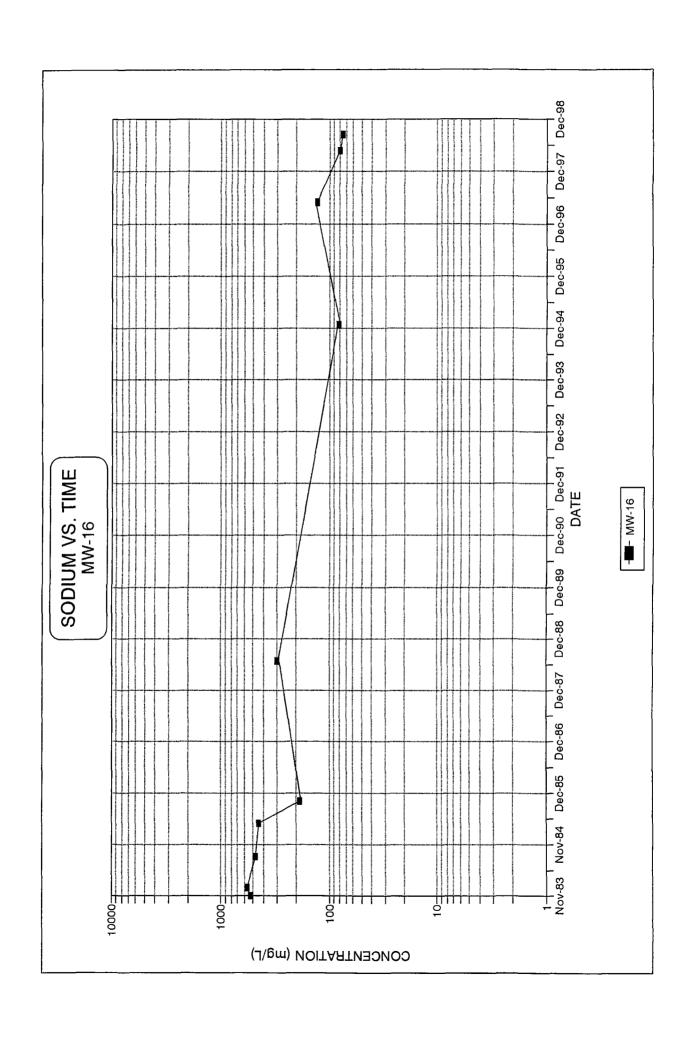
APPENDIX D-8

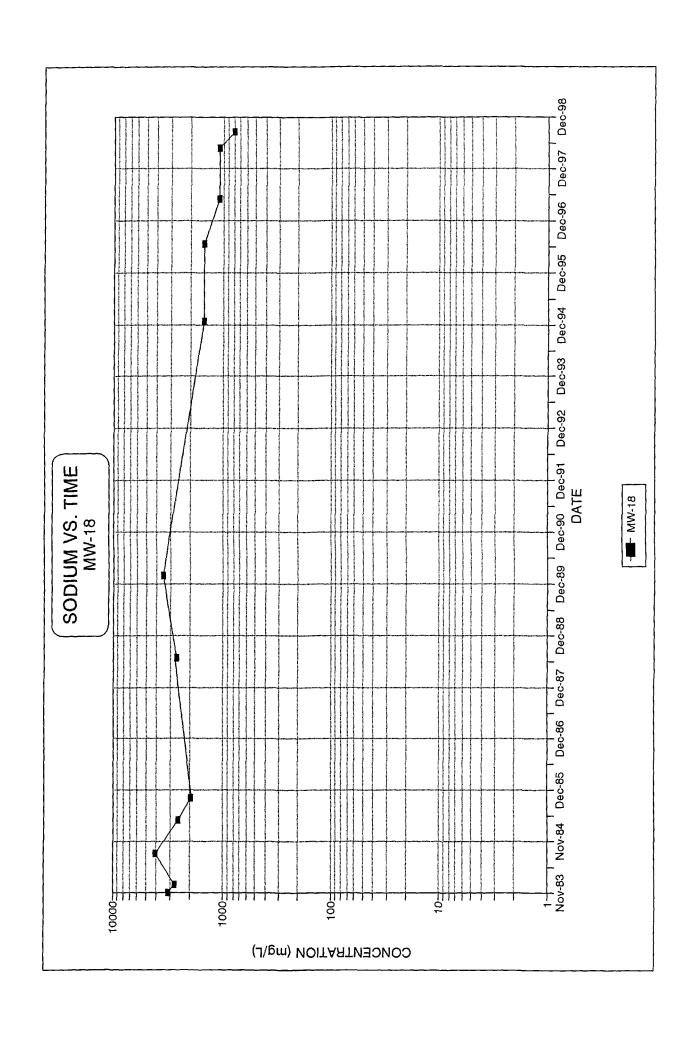
SODIUM

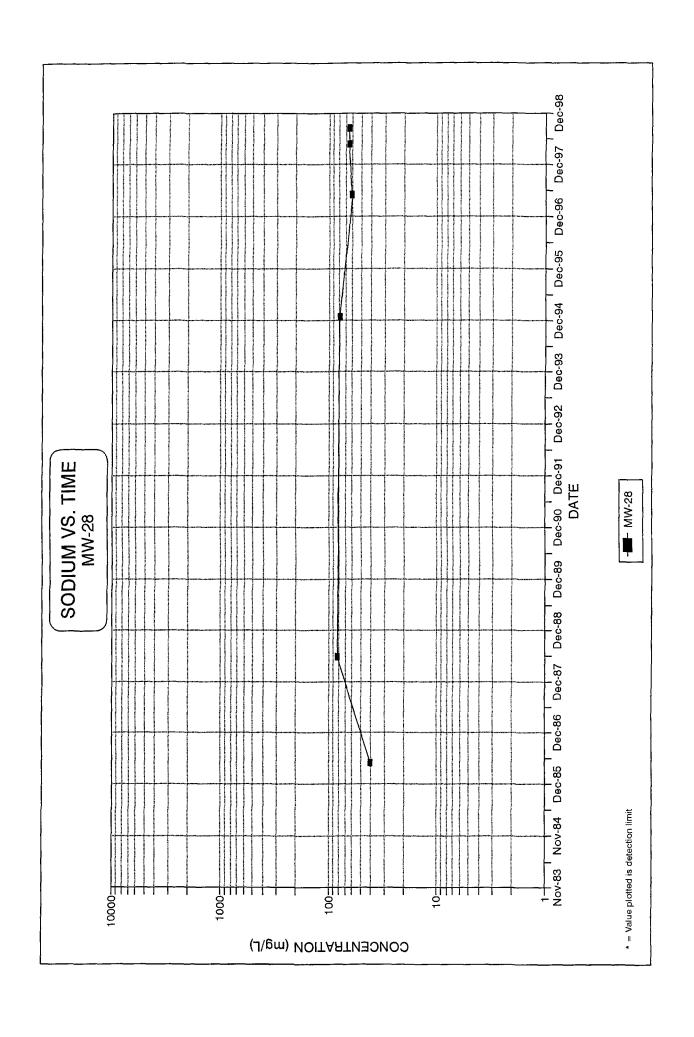


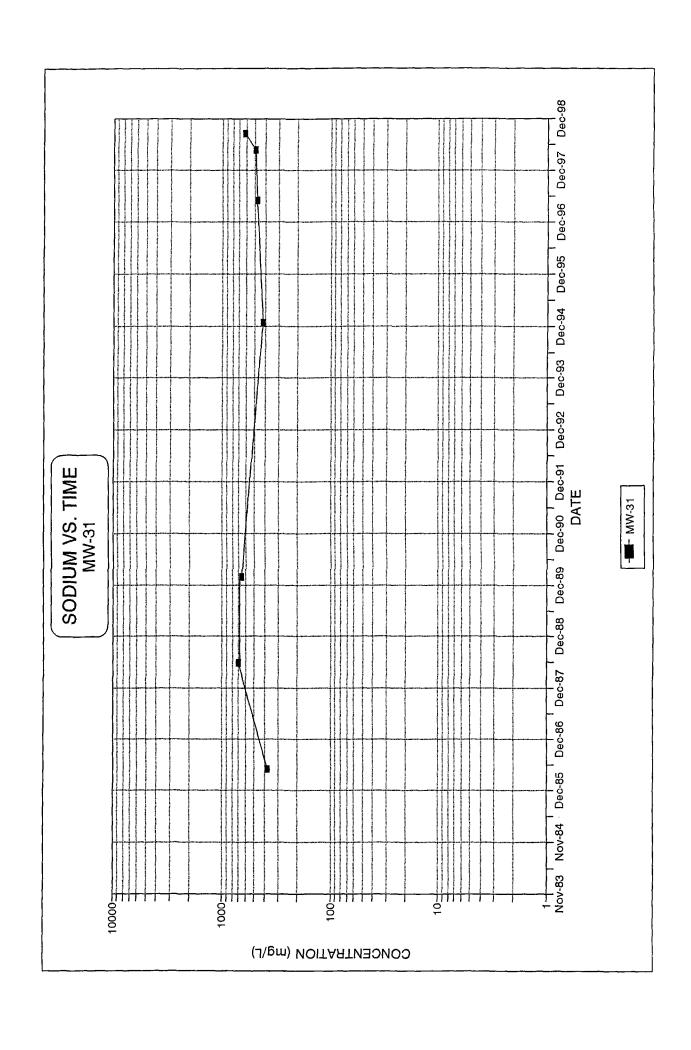


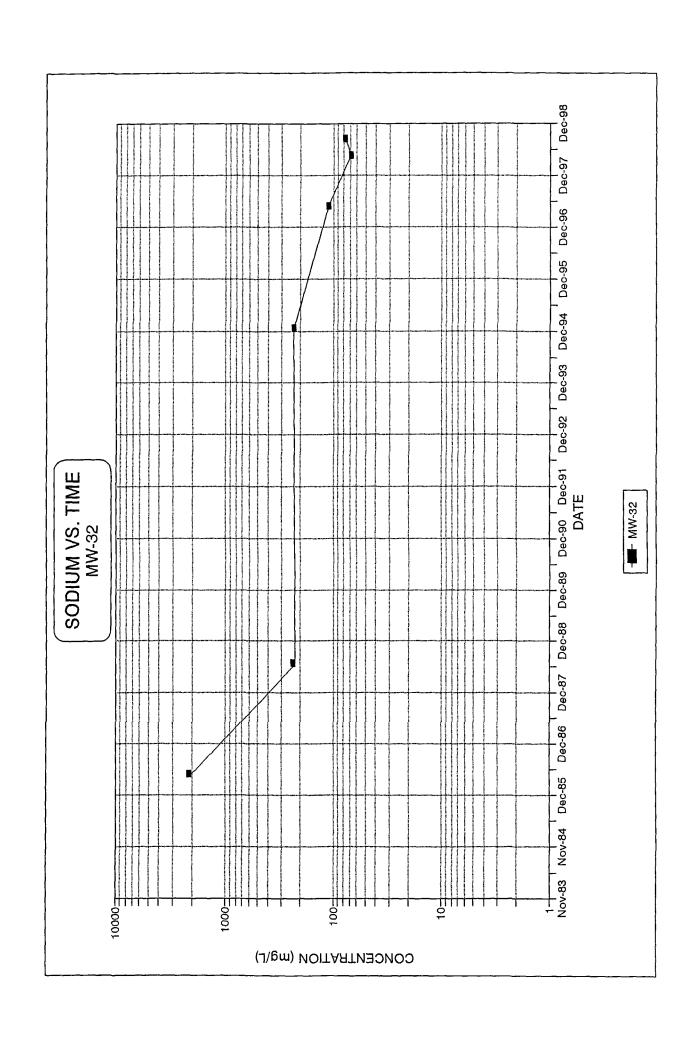


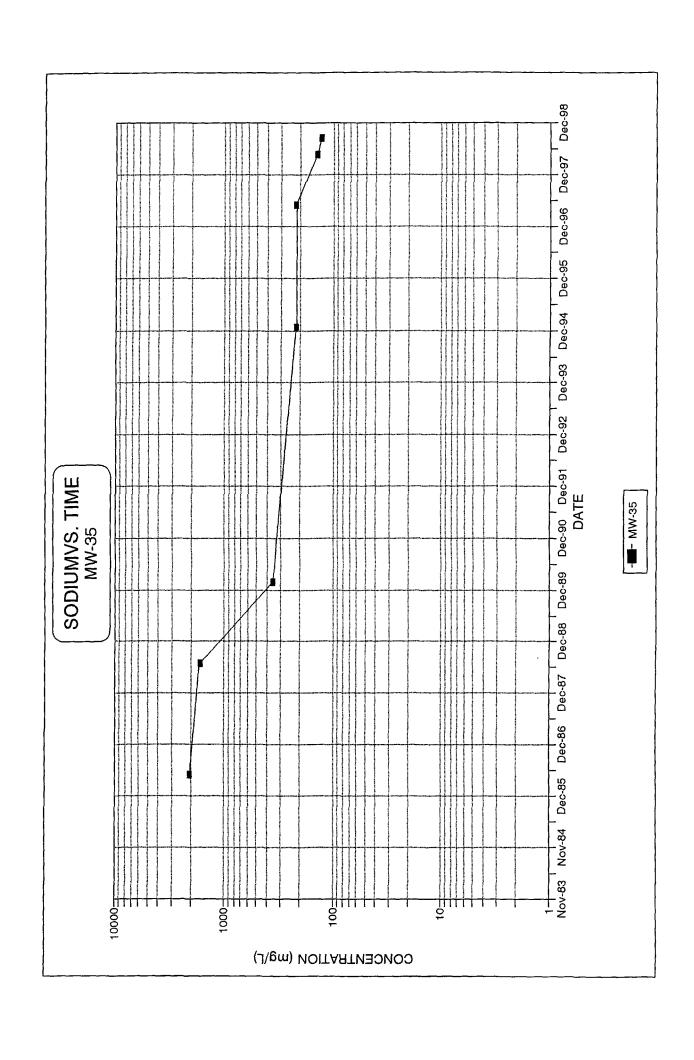


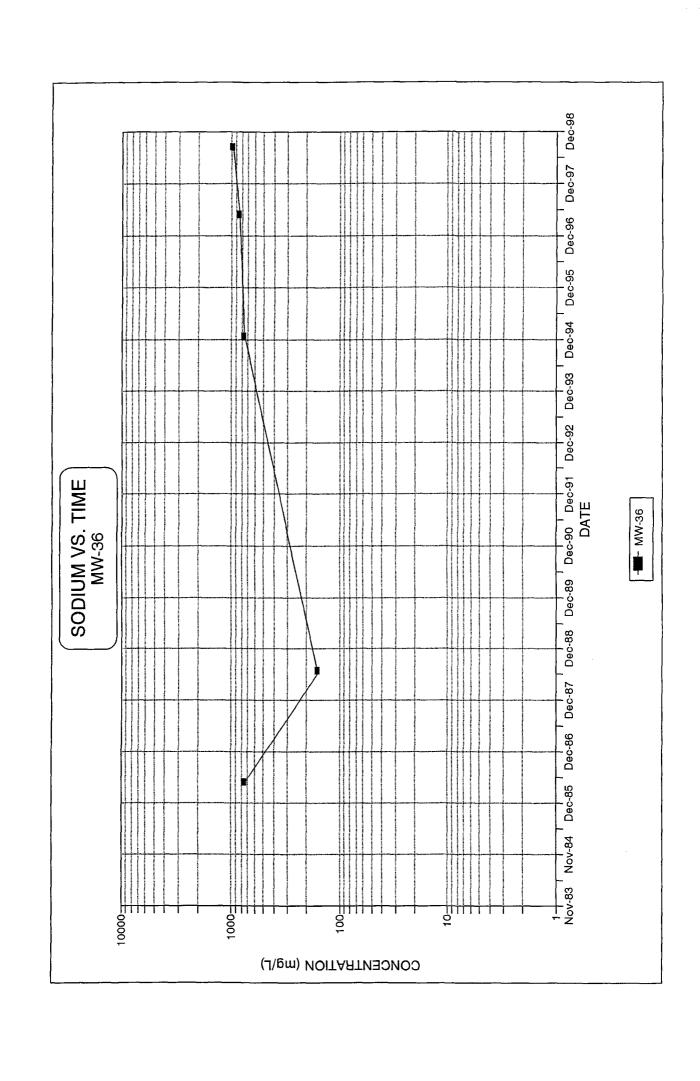


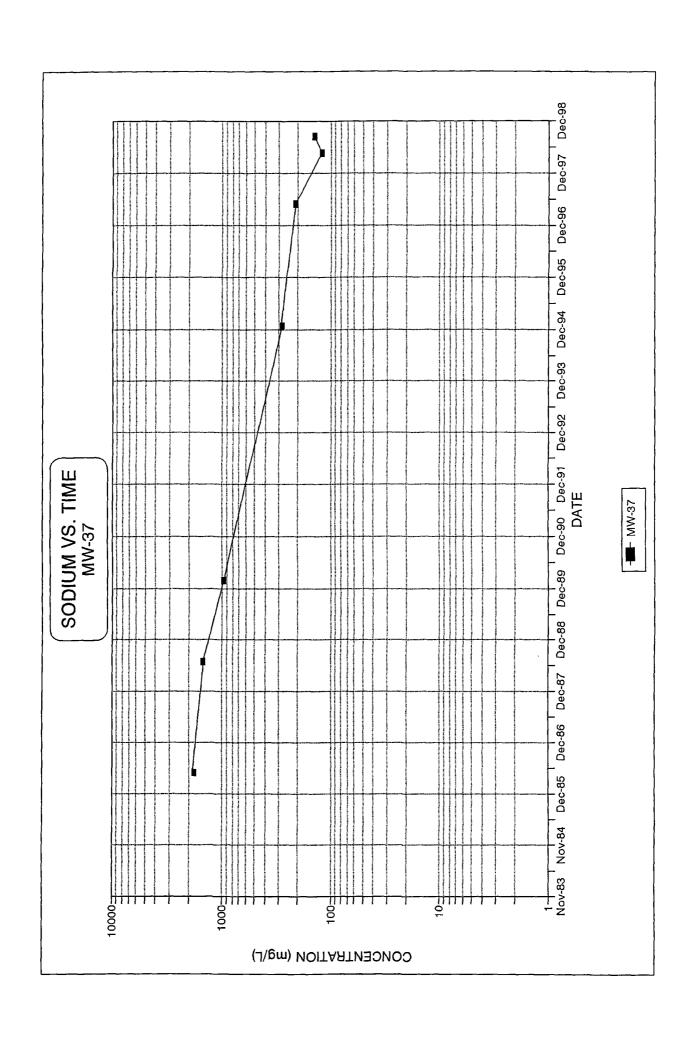












APPENDIX E

CONTAMINANT MASS-IN-PLACE ESTIMATION SUPPORTING DATA

Appendix E-1 May 1997 Monitoring Event

Appendix E-2 May 1998 Monitoring Event

APPENDIX E-1

MAY 1997 MONITORING EVENT

HydroSystems Management, Inc.

APPENDIX E-1 ANALYTICAL RESULTS FOR GROUND-WATER SAMPLES COLLECTED MAY 6-9, 1997

ORMET CORPORATION HANNIBAL, OHIO

SAMPLE I.D.:	MW-1	MW-2	MW-5	MW-7	MW-7 (Dup.)	MW-8	MW-10	MW-11	MW-12	MW-15	MW-15 (Dup.)	MW-16
DATE:	5/9/97	5/8/97	5/8/97	2/8/97	5/8/97	5/8/97	5/8/97	5/9/97	5/7/97	5/6/97	5/6/97	5/9/97
Cyanide, Total	<0.01	17	3.5	<0.01	<0.01	0.04	40.01	0.09	<0.01	2.8	3.3	1.3
Fluoride	0.1	63	16	0.1	0.2	2.2	0.7	1.8	6.0	1	8.9	-

	_	
0.18	8.1	
4.4	19	
6.2	93	
12	110	
<0.01	<0.1	
0.18	3.3	
0.6	44	
0.11	0.2	
<0.10	2.0	
8.7	200	
0.54	3.1	
Cyanide, Total	Fluoride	

MW-34D 5/6/97

MW-34S 5/6/97

MW-32 5/6/97

MW-31 (Dup.) 5/8/97

MW-31 5/8/97

MW-30 5/8/97

MW-29D 5/7/97

MW-29S 5/9/97

MW-28 5/9/97

MW-19 5/7/97

MW-18 5/8/97

MW-17 5/6/97

SAMPLE I.D.: DATE: 0.05

-										
SAMPLE I.D.:	MW-35	MW-36	MW-37	MW-39S	MW-39D	MW-40S	MW-40D	MW-41	MW-42S	MW-42D
DATE	2/6/97	2/6/97	2/6/97	5/7/97	5/7/97	5/7/97	5/7/97	5/6/97	5/7/97	5/7/97
Syanide, Total	16	8.1	13	3.6	0.06	0.72	0.59	<0.01	0.56	0.04
	40	180	53	150	3,8	27	7.6	0.2	29	3.2

NOTE: All results in mg/L.

96-E1a.VMG

APPENDIX E-1 (CONT.) PLUME CONTOUR AREA CALCULATIONS FOR TOTAL CYANIDE AND FLUORIDE

ORMET PRIMARY ALUMINUM SUPERFUND SITE HANNIBAL, OHIO

TOTAL		
CYANIDE	CONTOUR	CONTOUR AREA
	INTERVAL	in sqare feet
	(from Figure 3)	(estimated using CAD* software)
	>15 mg/L (rt)	30,864
	>15 mg/L (lt)	18,198
	10-15 mg/L	351,126
	5-10 mg/L	274,330
	1-5 mg/L	580,778
	0.2-1 mg/L	376,727

TOTAL	CONTOUR	CONTOUR AREA
FLUORIDE	INTERVAL	in sqare feet
	(from Figure 2)	(estimated using CAD* software)
	>200 mg/L	5,153
	150-200 mg/L	17,765
	>150 mg/L (rt)	11,337
	100-150 mg/L	158,399
	>100 mg/L	11,543
	50-100 mg/L (lg)	236,204
	50-100 mg/L (sml)	33,309
	>50 mg/L	13,291
	10-50 mg/L	827,869
	4-10 mg/L	450,443

^{*} CAD - Computer Aided Drafting

98-E1B.123

APPENDIX E-1 (CONT.) AVERAGE AQUIFER THICKNESS CALCULATIONS WITHIN EACH PLUME CONTOUR INTERVAL

ORMET CORPORATION HANNIBAL, OHIO

TOTAL CYANIDE

CONTOUR INTERVAL (from Figure 3)	MONITORING WELL	AQUIFER THICKNESS (in feet)	AVERAGE AQUIFER THICKNESS (b, in feet)
>15 mg/L (rt)	MW-35	11	11
>15 mg/L (lt)	MW-2	28	28
10-15 mg/L	MW-37	18	
,	MW-31	. 20	
	MW-35	11	
	MW-2	28	19
5-10 mg/L	MW-18	21	
0 70 mg/2	MW-32	16	
	MW-36	15	17
1-5 mg/L	MW-5	27	
1 o mg/L	MW-16	35	
	MW-39	41	
	MW-32	16	
	MW-15	20	28
0.2-1 mg/L	MW-28	26	
	MW-30	13	
	MW-8	28	
	MW-40	38	
	MW-29	41	
	MW-42	45	
			32

98-E1c.123

APPENDIX E-1 (CONT.) AVERAGE AQUIFER THICKNESS CALCULATIONS WITHIN EACH PLUME CONTOUR INTERVAL

ORMET CORPORATION HANNIBAL, OHIO

FLUORIDE

CONTOUR INTERVAL	MONITORING WELL	AQUIFER THICKNESS	AVERAGE AQUIFER THICKNESS
(from Figure 2)	<u> </u>	(in feet)	(b, in feet)
>200 mg/L	MW-18	21	21
150-200 mg/L	MVV-18	21	21
>150 mg/L	MVV-36	. 15	15
100-150 mg/L	MW-31	20	
	MW-36	15	
	MW-18	21	19
>100 mg/L	MVV-39	41	41
50-100 mg/L (lg)	MW-2	28	
	MW-32	16	
	MW-31	20	21
50-100 mg/L (sml)	MW-39	41	
	MW-42	45	
	MW-29	41	42
>50 mg/L	MW-37	18	18
10-50 mg/L	MW-35	11	
	MVV-15	20	
	MW-5 MW-40	27 38	
	MVV-29	41	
	MW-42	45	
	MW-16	35	
	MW-32	16	29
4-10 mg/L	MW-28	47	
, ,5 mg/L	MW-30	13	
	MW-1	16	
	MVV-11	32	
			27

98-E1d.123

HydroSystems Management, Inc.

APPENDIX E-1 (كالك) TOTAL CYANIDE AND FLUORIDE MASS-IN-PLACE CALCULATION WORKSHEET

ORMET CORPORATION HANNIBAL, OHIO

-			Average	-		.5	ന്		4	,
	Contour	Contour Interval	Aquifer	Aquifer		Volume of	Volume of	Average	Mass-in-Place	Mass-in-Place
	Interval	Area	Thickness	Volume	Aquifer	Ground Water	Ground Water	Concentration	for each interval	for each interval
	(from Figure 3)	(in square feet)	(in feet)	(in cubic feet)	Porosity	(in cubic feet)	(in Liters)	(mg/L)	(ju mg)	(in lbs)
		A	q	۸×	c	Vgw	Vgw	Cwi	Mi	Mi
					,					
,	>15 mg/L (rt)	30864	=	339,504	0.25	84,876	2,403,688	16.0	38,459,008	85
	>15 mg/L (It)	18198	28	509,544	0.25	127,386	3,607,572	17.0	61,328,724	135
TOTAL	10-15 mg/L	351126	19	6,671,394	0.25	1,667,849	47,233,483	12.5	590,418,538	1,302
CYANIDE	5-10 mg/L	274330	17	4,663,610	0.25	1,165,903	33,018,372	7.5	247,637,790	546
	1-5 mg/L	580778	28	16,261,784	0.25	4,065,446	115,133,431	3.0	345,400,293	762
	0.2-1 mg/L	376727	32	12,055,264	0.25	3,013,816	85,351,269	9:0	51,210,761	113
							-	1	TOTAL Orogida Mar	6700
									O OL Cyaning inter-	2,943
•••••	(from Figure 2)		_							
	>200 mg/L	5153	21	108,213	0.25	27,053	766,141	200.0	153,228,200	338
	150-200 mg/L	17765	21	373,065	0.25	93,266	2,641,293	175.0	462,226,275	1,019
	>150 mg/L	11337	15	170,055	0.25	42,514	1,203,996	180.0	216,719,280	478
	100-150 mg/L	158399	19	3,009,581	0.25	752,395	21,307,826	125.0	2,663,478,250	5,873
FLUORIDE	>100 mg/L	11543	41	473,263	0.25	118,316	3,350,709	150.0	502,606,350	1,108
	50-100 mg/L (lg)	236203	21	4,960,263	0.25	1,240,066	35,118,669	75.0	2,633,900,175	5,808
	50-100 mg/L (sml)	33308	42	1,398,936	0.25	349,734	9,904,467	75.0	742,835,025	1,638
	>50 mg/L	13291	18	239,238	0.25	59,810	1,693,819	53.0	89,772,407	198
	10-50 mg/L	827869	29	24,008,201	0.25	6,002,050	169,978,056	30.0	5,099,341,680	11,244
	4-10 mg/L	450443	27	12,161,961	0.25	3,040,490	86,106,677	7.0	602,746,739	1,329
					•		_			
									TOTAL Fluoride Mw:	29,033

VA = A x b
 Vgw = VA x n
 Vgw in ft3 multiplied by 28.32 L/ft3 = Vgw in Liters
 Mi = Vgw x Cwl
 Mi = Vgw x Cwl
 Mi in mg divided by 1000 mg/g multiplied by 2.205x10-3 lb/g = Mi in pounds

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APPENDIX E-2

MAY 1998 MONITORING EVENT

HydroSystems Management, Inc.

ANALYTICAL RESULTS FOR GROUND-WATER SAMPLES COLLECTED MAY 4-7, 1998 APPENDIX E-2

ORMET CORPORATION HANNIBAL, OHIO

MW-10 MW-11 MW-12 MW-15 MW-16 FIF/98 5/6/98		0.15 0.02 <0.01 0.49 2.0	
MW-8		0.02	2.3
MW-7		<0.01	0.20
MW-5		1.3	18
MW-2		13	89
MW-1	200	<0.01	0.20
SAMPLE I.D.:	1100	Cyanide, Total	Fluoride

MW-34D 5/7/98

MW-34S 5/98

MW-32 (Dup.) 5/4/98

MW-32 5/4/98

MW-31 2/6/98

MW-30 86/9/9

MW-29D 5/7/98

MW-29S 5/7/98

MW-28 5/5/98

MW-19 5/4/98

MW-18 2/6/98

MW-17 5/7/98

DATE: SAMPLE I.D.:

3.9

SS SS

2.5

2.5

9.3

<0.01 0.10

3.5

0.18

0.12

<0.01 1.4

9.8

0.72

Cyanide, Total Fluoride

MW-42D		
MW-42S		
MW-41		
MW-40D		
MAZAOS		
MW.39D		
S627V/W		
MANAL 37		
MANAL 36		
AMA/ 25		
CAMPIELD.		
	_	

SAMPLE I.D.:	MW-35	MW-36	MW-37	WW-39S	MW-39D	MW-40S	MW-40D	MW-41	MW-42S	MW-42D
DATE:	5/4/98	5/98	5/4/98	5/5/98	5/5/98	5/5/98	5/5/98	5/4/98	96/9/9	5/6/98
Syanide, Total	15	SN	6.4	2.3	0.04	0.36	0.49	<0.01	0.52	70:0
-luoride	27	SN	6.8	86	3.6	39	19	0:30	27	3.3

NOTE: All results in mg/L.

NS = Not sampled, well damaged during remedial construction. Not accessible for sampling during 5/98 event.

98-E2a.123

APPENDIX E-2 (CONT.) PLUME CONTOUR AREA CALCULATIONS FOR TOTAL CYANIDE AND FLUORIDE BASED ON RESULTS OF SAMPLING CONDUCTED MAY 4-7, 1998

ORMET PRIMARY ALUMINUM SUPERFUND SITE HANNIBAL, OHIO

TOTAL		
CYANIDE	CONTOUR	CONTOUR AREA
	INTERVAL	in sqare feet
	(from Figure 3)	(estimated using CAD* software)
	10-15 mg/L (MW-2)	38,526
	10-15 mg/L (FSPSA)	141,017
	5-10 mg/L	416,575
	1-5 mg/L	730,644
	0.2-1 mg/L	321,707

TOTAL	CONTOUR	CONTOUR AREA
FLUORIDE	INTERVAL	in sqare feet
	(from Figure 2)	(estimated using CAD* software)
	>200 mg/L	5,485
	150-200 mg/L (MW-18)	11,501
	150-200 mg/L (MW-36)	10,699
	100-150 mg/L	109,819
	50-100 mg/L (lg)	274,638
	50-100 mg/L (sml)	26,097
	10-50 mg/L	786,913
	4-10 mg/L	352,899

^{*} CAD - Computer Aided Drafting

98-E2b.123

APPENDIX E-2 (CONT.) AVERAGE AQUIFER THICKNESS CALCULATIONS WITHIN EACH PLUME CONTOUR INTERVAL BASED ON RESULTS OF SAMPLING CONDUCTED MAY 4-7, 1998

ORMET CORPORATION HANNIBAL, OHIO

TOTAL CYANIDE

CONTOUR			AVERAGE
INTERVAL	MONITORING WELL	AQUIFER THICKNESS	AQUIFER THICKNESS
(from Figure 3)	L ID	(in feet)	(b, in feet)
10-15 mg/L	MVV-18	17.81	
(FSPSA)	MW-31	19.83	
,	MW-35	10.08	15.90
10-15 mg/L (MW-2)	MW-2	26.24	26.24
5-10 mg/L	MW-2	26.24	
0 / 5 mg/ _	MW-5	24.63	
	MVV-18	17.81	
	MW-31	19.83	
	MW-32	16.50	
	MW-37	16.11	20.19
	10100-57	10.11	20.19
4.5	BANA/ F	04.00	
1-5 mg/L	MW-5	24.63	
	MW-8	25.38	
	MW-16	33.37	
	MW-18	17.81	
	MW-28	23.80	
	MW-39	38.86	
	MW-32	16.50	25.76
	<u></u>		
0.2-1 mg/L	MW-5	24.63	
	MW-10	26.08	
	MW-15	19.73	
	MW-17	39.92	
	MW-28	23.80	
	MW-30	10.89	
	MW-8	25.38	
	MW-40	37.65	
	MW-29	41.51	
	MW-42	44.49	29.40
		, 10	20.70

APPENDIX E-2 (CONT.) AVERAGE AQUIFER THICKNESS CALCULATIONS WITHIN EACH PLUME CONTOUR INTERVAL BASED ON RESULTS OF SAMPLING CONDUCTED MAY 4-7, 1998

ORMET CORPORATION HANNIBAL, OHIO

FLUORIDE

CONTOUR INTERVAL (from Figure 2)	MONITORING WELL ID	AQUIFER THICKNESS (in feet)	AVERAGE AQUIFER THICKNESS (b, in feet)
>200 mg/L	MW-18	17.81	17.81
150-200 mg/L	MVV-18	17.81	17.81
150-200 mg/L	MVV-36	15*	15*
100-150 mg/L	MVV-31 MVV-36 MVV-18	19.83 15* 17.81	17.55
50-100 mg/L (lg)	MW-2 MVV-18 MVV-32 MVV-31 MVV-36 TH-11	26.24 17.81 16.50 19.83 15* 18.86	19.04
50-100 mg/L (sml)	MW-39	38.86	38.86
10-50 mg/L	MW-2 MW-35 MW-5 MW-40 MW-29 MW-42 MW-16 MW-32 TH-11	26.24 10.08 24.63 37.65 41.51 44.49 33.37 16.50 18.86	28.15
4-10 mg/L	MVV-28 MVV-30 MVV-1 MVV-11 MVV-37 TH-11 MVV-15 MVV-34 MVV-17 MVV-12 MVV-14	23.80 10.89 15.72 30.16 16.11 18.86 19.73 32.17 39.92 44.15 49.35	27.35

^{* -} MW-36 damaged and inaccessible during 5/98 sampling event. Aquifer thickness taken from historical data.

98-E2d.123

APPEN. ... É-2 (CONT.) TOTAL CYANIDE AND FLUORIDE MASS-IN-PLACE CALCULATION WORKSHEET BASED ON RESULTS OF SAMPLING CONDUCTED MAY 4-7, 1998 ORMET CORPORATION HANNIBAL, OHIO

		. 1	Average	1.		2.	જં .	•	₹ .	rç.
	Contour	Contour Interval	Aquirer	Aquirer		Volume of	Volume of	Average	Mass-in-Place	Mass-in-Place
	Interval	Alea	LINCKNESS	volume	Aquirer	Ground Water	Ground Water	Concentration	for each interval	for each interval
	(from Figure 3)	(in square reet)	(in reet) b	(in cubic feet)	Porosity	(in cubic feet)	(in Liters) Vgw	(mg/L) Cwi	(in mg) Mi	(in lbs) Mi
	10-15 mg/L (MW-2)	38,526	26.24	1,010,922	0.25	252,731	7,157,342	13.0	93,045,446	205.1
TOTAL	10-15 mg/L (FSPSA)	141,017	15.90	2,242,170	0.25	560,542	15,874,549	12.5	198,431,863	437.5
CYANIDE	5-10 mg/L	416,575	20.19	8,410,649	0.25	2,102,662	59,547,388	7.5	446,605,410	984.6
	1-5 mg/L	730,644	25.76	18,821,388	0.25	4,705,347	133,255,427	3.0	399,766,281	881.3
	0.2-1 mg/L	321,707	29.40	9,458,186	0.25	2,364,546	66,963,943	9.0	40,178,366	88.6
			_			,			TOTAL Cyanide Mw:	2,597.1
					<u>-</u>					
	>200 mg/L	5,485	17.81	97,139	0.25	24,285	687,751	260.00	178,815,260	394.2
- ;	150-200 mg/L (MW-18)	11,501	17.81	204,833	0.25	51,208	1,450,211	175.0	253,786,925	559.5
	150-200 mg/L (MVV-36)	10,699	15	160,485	0.25	40,121	1,136,227	175.0	198,839,725	438.4
	100-150 mg/L	109,819	17.55	1,927,323	0.25	481,831	13,645,454	125.0	1,705,681,750	3,760.4
FLUORIDE	50-100 mg/L (lg)	274,638	19.04	5,229,108	0.25	1,307,277	37,022,085	75.0	2,776,656,375	6,121.5
	50-100 mg/L (sml)	26,097	38.86	1,014,129	0.25	253,532	7,180,026	75.0	538,501,950	1,187.2
	10-50 mg/L	786,913	28.15	22,151,600	0.25	5,537,900	156,833,328	30.0	4,704,999,840	10,372.8
	4-10 mg/L	352,899	27.35	9,651,788	0.25	2,412,947	68,334,659	7.0	478,342,613	1,054.6
									1	
					_				I O I AL FILIONIDE MW:	23,888.6

VA = A x b
 Vgw = VA x n
 Vgw if ft3 multiplied by 28.32 L/ft3 = Vgw in Liters
 Wgw x Gwi
 Mi = Vgw x Gwi
 Mi = Vgw X Gwi
 Mi in mg divided by 1000 mg/g multiplied by 2.205x10-3 lb/g = Mi in pounds